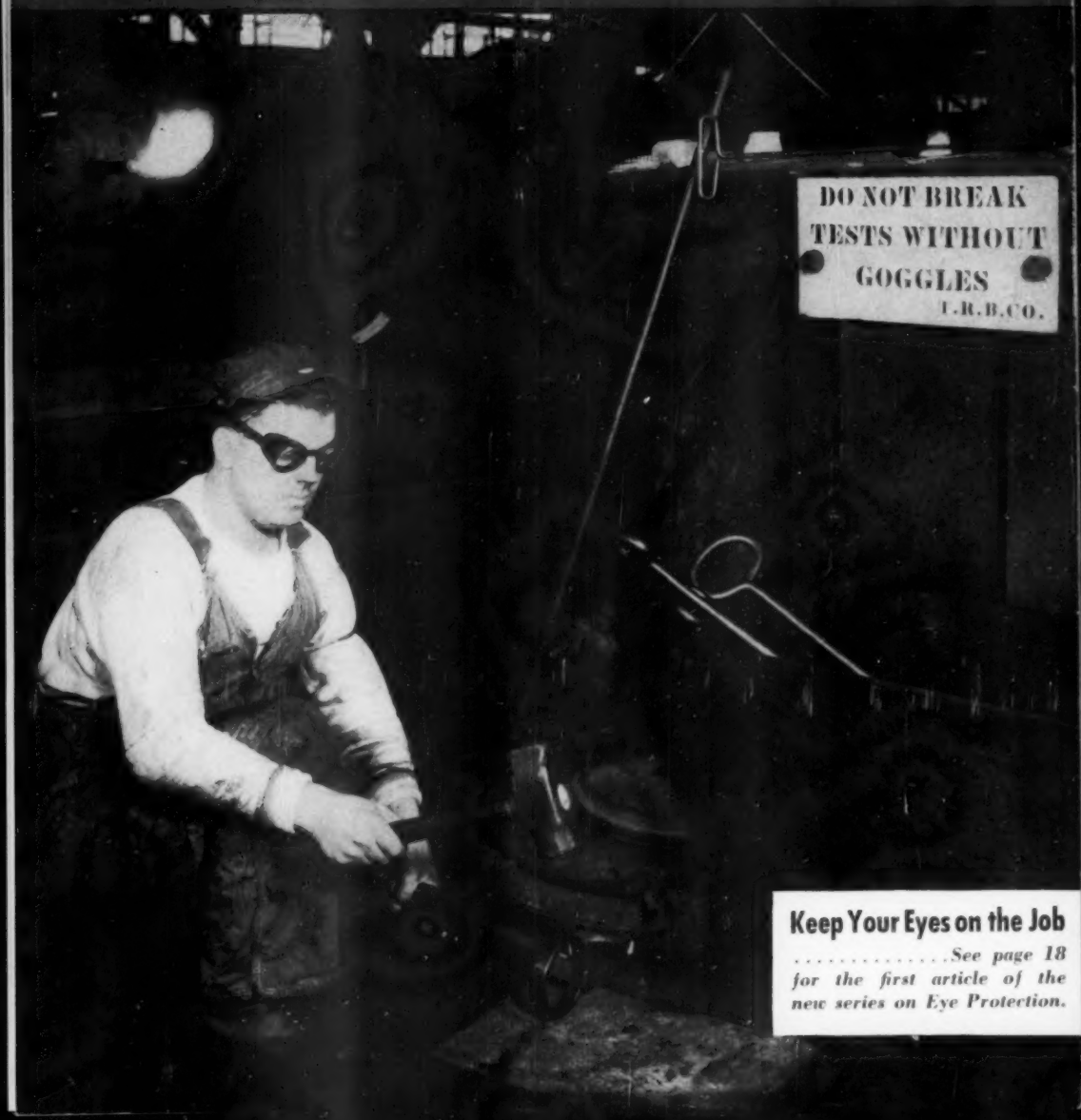
SAFETY ENGINEERING

AMERICA'S PIONEER SAFETY MAGAZINE

APRIL 1950
Vol. 99 • No. 4
FIFTY CENTS



Keep Your Eyes on the Job

. . . . . See page 18 for the first article of the new series on Eye Protection.

Give Workers the Protection They Need
in a Lightweight Goggle They'll Wear

AO FUL-VUE Acetate GOGGLE

Light and comfortable, yet strong and durable, the AO F9200 Ful-Vue Acetate Goggle is protection safety directors and workers see "eye to eye" on. Tough, heat-treated AO Super Armorplate lenses give maximum frontal protection while rugged acetate side shields give utmost protection from particles striking laterally. The perforated shields ventilate the eye areas and prevent lens fogging. Your nearest AO Safety Products Representative can supply you.

QUICK FACTS

High set end pieces keep hinges and temples from blocking vision.

Light but strong keyhole bridge has ample face form for added protection and comfort.

Lenses are orbit-shaped—conform to and cover eye for maximum utility and appearance.

Nose pads have broad bearing surfaces for extra comfort.

Available with comfort cable temples (metal core for easy adjustment) or skull temples (extra strong wire core, acetate-enclosed).

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This sturdy Hy-Test steel-toe safety shoe (H779) is especially designed for workers in jobs involving chemicals and acids. It combines specially selected materials and construction features that make it the best possible leather shoe for wear under these conditions... oil impregnated Rosite upper, storm welt, brass riveted vamp seams, Resist-Oil sole and heel, genuine Goodyear welt *plus* brass nailed sole construction.

Another HY-TEST
PLUS

Hy-Test Safety Shoes feature one piece Isco-nap vamp linings. Isco-nap assures long wear, lasting fit and air-conditioned comfort.

... Insure Workers' Feet in Sure Protection

with
HY-TEST SAFETY SHOES

HY-TEST SAFETY SHOES

Now— PORTABLE VENTILATOR

M·S·A
PORTABLE VENTILATION EQUIPMENT

Compressed Air or Steam Operated Type

The M.S.A.-LAMB AIR-MOVER converts efficiently the pressure of compressed air or steam into very large, induced volumes of air. Light, quickly set up, no moving parts.

Capacities of from 250 CFM to over 7,500 CFM with the following models:

Cat. No. DP-32119—MSA-Lamb Air-Mover 3" Model

Cat. No. DP-32120—MSA-Lamb Air-Mover 6" Model

Cat. No. DP-33552—MSA-Lamb Air-Mover 10" Model

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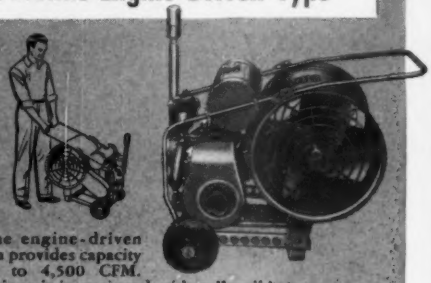
Cat. No. CU-44914—MSA Welding Fume Exhauster complete with 12-foot metal hose, for operation on 115 volts AC/DC. Available also with 220-volt motor.

Gasoline Engine Driven Type

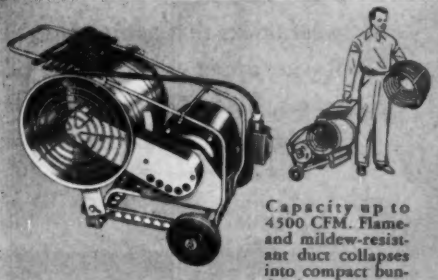


The engine-driven fan provides capacity up to 4,500 CFM. This unit is equipped with collapsible canvas duct to convey air to desired point.

Cat. No. CU-33953—MSA Portable Ventilator with Gasoline Engine and 16' of 14" diameter collapsible duct.

Electric Motor Driven Type

Explosion Proof



Capacity up to 4500 CFM. Flame- and mildew-resistant duct collapses into compact bundle for carrying.

Cat. No. CU-33954—MSA Portable Ventilator with explosion-proof motor Class I Group D and 16' collapsible duct for operation on 115 volts 60 cycle AC.

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OIL RESISTING
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THE DIFFERENCE IS JUST 96 TO 1

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Each belt was buckled around a 300 lb. iron weight and dropped to the end of a steel cable.

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Later, in public tests at Denver, instead of the tripod a 50 ft. railroad crane was used in order to get a long enough free fall to further prove the life-saving power of Safe-Hi Shock Absorber Belts. A stock model construction belt with standard Unolyn shock absorber was buckled around the same 300 lb. test weight and subjected to ***a 24 foot drop test—without failure.***

FOR FULL INFORMATION
on "Safe-Hi" line of Construction Belts and Window Cleaners Belts
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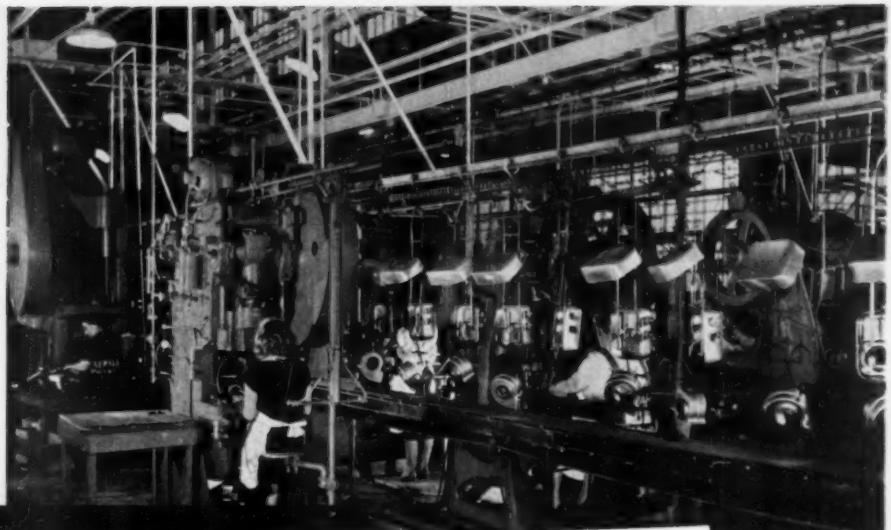

Increased efficiency...
Lower manufacturing costs...
No accident time-loss...

...with
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Modern painting system brings benefits to management and workers alike in Automotive Heater Division of Eaton Manufacturing Company

EATON Manufacturing Company of Cleveland, Ohio, is proving—by actual experience—how Pittsburgh COLOR DYNAMICS benefits management and workers alike as it *increases the amount of work per man-hour and the number of man-hours per worker.*

● **Eaton produces** a variety of parts for the automotive industry. Its vast truck and car heater plant is one of the world's largest.

Late last year this entire heater plant was repainted according to COLOR DYNAMICS. Following the principles of the *energy in color, focal* colors were painted on operating parts of machinery and *eye-rest colors* on stationary parts to aid workers to see their tasks better and to reduce eye fatigue. Walls and ceiling were finished with *morale-building* colors to provide additional eye-rest areas. *Safety* colors were used to reduce accident hazards.

● **"As a result of repainting** according to COLOR DYNAMICS", reports W. A. Mattie, superintendent of the Heater Division, "we have noticed improvement in operating efficiency, employee morale and general plant cleanliness.

"When our plant was a dull gray, workers seldom bothered to pick up small parts used in assembly operations. They were usually swept up and discarded. Today, employees are so proud of their clean surroundings they pick up these items, effecting worth-while savings for us.

● **"By increasing** our efficiency, COLOR DYNAMICS has helped us to cut manufacturing costs. We think the 20 percent reduction in absenteeism is also directly traceable to the new color plan. Nor have we had a single hour of lost time because of injury since we repainted."

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There's a trained color expert at each of our offices located in all principal cities. Call your nearest Pittsburgh Plate Glass Company branch and arrange to have our COLOR DYNAMICS representative see you at your convenience. Or send the coupon below.

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Widths A-E

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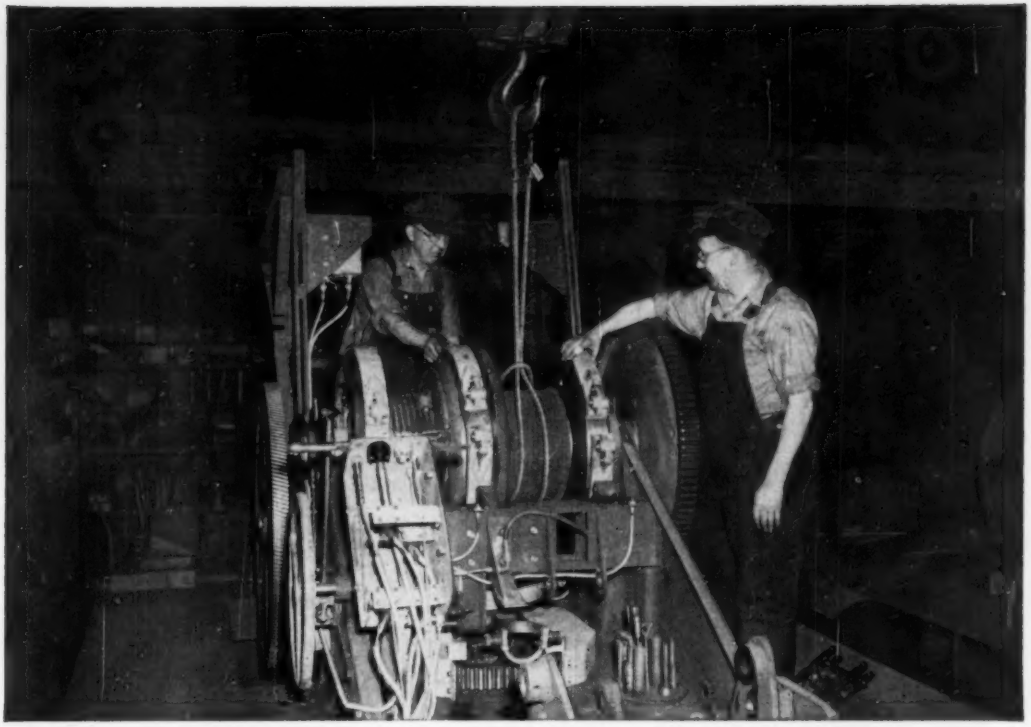
Pittsburgh 22, Pa.



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with flexibility comparable to fiber rope

ACCO REGISTERED WIRE ROPE SLINGS rate high with Safety Engineers. However, operating men are often reluctant to adopt new equipment when it means a departure from long-established ways of handling standard jobs.

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The picture above illustrates a case in point. The hitch is a typical fiber rope hitch. But the sling is not fiber rope. It is a Double ACCO-LOC Cable Laid Grommet. It has all the safety, dependability and uniformity of an all-steel, machine laid sling with flexibility comparable to fiber rope. The patented splice develops the full strength of the sling body—plus giving an armored section to use at point of greatest wear.

Like all ACCO Registered Wire Rope Slings, these grommets are rated as to capacity—proof-tested to twice the rated capacity.

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SAFETY ENGINEERING

The Magazine of Safety

Reg. U. S. Pat. Off.

A MONTHLY PUBLICATION DEDICATED TO ACCIDENT PREVENTION, HEALTH CONSERVATION AND FIRE CONTROL.
EST. 1901

VOLUME 99, NO. 4 APRIL, 1950

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Cover: The Timken Roller Bearing Company

AMERICA'S PIONEER SAFETY MAGAZINE

SAFETY ENGINEERING is indexed regularly by Engineering Index, Inc., New York

Look what the "cat" dragged in

Charley Grecco has a soft spot in his heart for Lehigh Safety Shoes. This one saved him from being crippled for life! He was standing on the "cat" track of a bulldozer when the machine slipped in gear and started to roll. His shoe was gripped in the treads . . . mangled against the frame! But Lehigh's extra-tough construction proved its worth again. The steel toe box was barely dented. The sole-leather counter kept the back of his foot from being sheared off. The "cat" treads gouged through the double leather sole...but stopped against the steel arch-shank underneath. When he got the shoe off, Charley had a couple of bruises...nothing worse. Want guts in *your* safety shoes? This is how LEHIGH builds them all!

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How do your employees WANT to invest their savings?

People are *more than twice as inclined* to invest their extra money in Savings Bonds as in any other form of savings or investment, according to the 1949 Survey of Consumer Finances*. That's adequate proof that your employees want your company to have the Payroll Savings Plan, by which they get the convenience of obtaining bonds regularly and "automatically"— delivered with their pay checks.

More than 20,000 companies operate Payroll Savings. The managements of these companies know it's "good relations" to provide this convenience. They can *see* the company-benefits in improved worker efficiency and stability. They know, too, that it's "good business"—because Payroll Savings boosts Bond sales, and Bond sales create a huge backlog of purchasing power that's "business insurance" for the years ahead.

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**Sponsored by the Board of Governors of the Federal Reserve System and conducted by the University of Michigan. Based on 3,500 interviews in 66 sampling areas throughout the nation.*

The Treasury Department acknowledges with appreciation the publication of this message by

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This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and The Advertising Council.

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It's Safe to Say

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★ A TOUCH OF LAVENDER

NEARING its fiftieth birthday, SAFETY ENGINEERING is still too young as publications go to spend too much time waxing historical. Nevertheless an occasional backward glance over the shoulder can be understood in April, the birth month of this magazine.

Youthful as we are, at least mentally, we can report much water over the safety dam since April, 1901 when SAFETY ENGINEERING came into being. In the first place, there was no such thing as an organized safety movement for the reason that accidents were considered the normal and even inevitable result of any industrial operation. Fires were viewed in a somewhat different light—they were considered a controllable and perhaps preventable hazard provided that reasonable thought was given to the possibility of fire spread and the ultimate cost of fire. In fact, the very first article in our first issue (volume one, number one) dealt with fire protection.

On the other hand, an accident involving perhaps the loss of an eye, an arm, a leg or life itself was merely an unfortunate price to be paid for working in industry. As for frequency and severity rates, insurance tables and records of indirect costs, those factors were very much in the future.

Hazards too have undergone a drastic change over the years. Many erstwhile industrial hazards are now lost in limbo only to be replaced by others equally severe and challenging to safety departments, plant employees and top level management. At least, however, there is a consciousness constantly growing that accidents, like fire, can be anticipated and given the preventive treatment before costly tragedy may strike.

Within the past fifty years, SAFETY ENGINEERING has seen the passage of workmen's compensation laws, the tremendous contribution to safety made by insurance writing organizations, the incalculable advancement made by manufacturers of protective devices and equipment and the general acceptance of well-organized safety conventions. In fact, this publication was instrumental in organizing the first national-scale safety congress ever held in this country. That meeting was indeed a far cry from the successful *regional* safety conference of the Greater New York Safety Council which has just closed after attracting a record-breaking delegation of many thousand safety enthusiasts from this district alone.

Enough of nostalgia usually associated with advanced age, mothballs, lavender and old lace. We are too busy not only following trends but even helping to make some of those trends.

As new needs and ideas come into existence for the greater advancement of every phase of safety, SAFETY ENGINEERING will be, we hope, well up in front, at least as observers and reporters. When those needs arise, no one here will say, "it was good enough a generation ago, so it's good enough now." One very significant change will be noted, incidentally, in the box announcement found at the bottom of this page.

And there will be others coming along very soon.

H.A.

NEW PUBLICATION DATE

Effective with this issue,

***SAFETY ENGINEERING* will be published on the 1st instead of the 15th of each month**

EYE SAFETY

is a TWO-IN-ONE program

No eye safety program is complete unless it is built on the basis of *protection plus correction. Protection* against the many hazards which can cause costly eye accidents. *Correction,* professionally-prescribed, for the 50% of workers whose vision needs refractive help if they are to see clearly . . . or safely. Call on your Bausch & Lomb distributor for prompt prescription service on industrial eyewear. Your safety record and your production record will improve.

Write for a copy of the new Bausch & Lomb catalog on industrial eyewear. It includes a highly informative discussion of the theory and design of protective industrial eyewear. It also describes the complete line of Bausch & Lomb Occupational Eyewear, the eyewear built to the highest quality standards. Bausch & Lomb Optical Co., 693-P St. Paul St., Rochester 2, N. Y.

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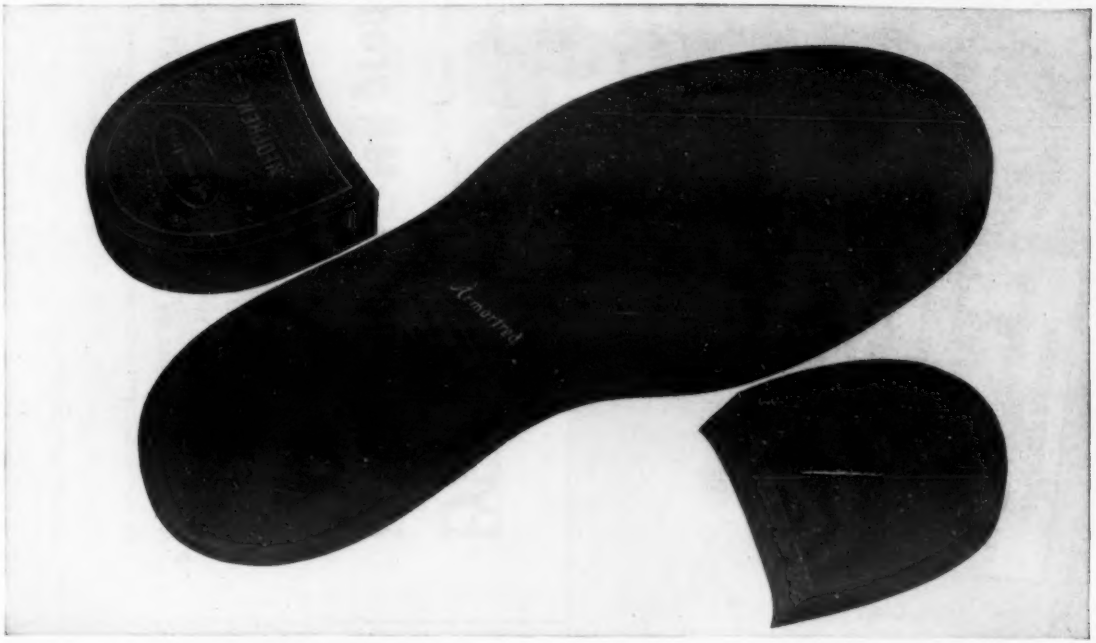

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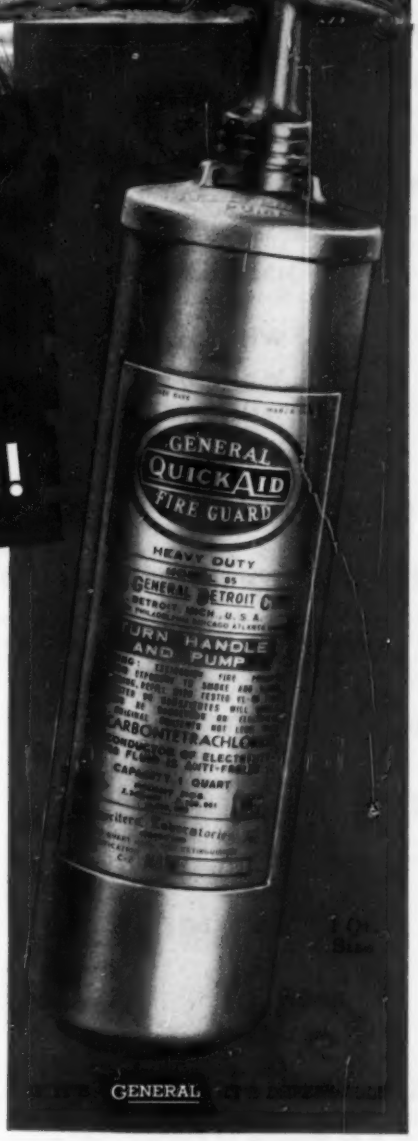

When fire strikes, every second counts. The speed of your fire extinguisher may mean the difference between a small blaze and a huge loss in life and property. The exclusive patented Safety Phlare and Panic Proof handle found only on Quick Aid Extinguishers enable you to fight fire fast and fight it effectively. Quick Aid Vaporizing Liquid Extinguisher (shown at right) is widely recognized as America's great utility fire extinguisher, and is Underwriters' Approved for office, factory, home, store, farm, car, truck, boat, or plane. Recommended for gasoline, oil, paint, electrical, and similar fires. Available in 1 and 1½ qt. sizes. Look in the classified section of your telephone book for the Quick Aid trade mark, or write direct for the name of your nearest dealer.

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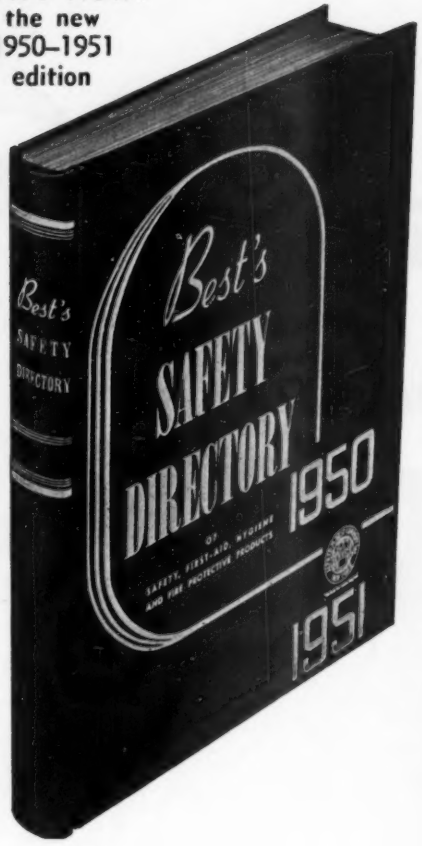

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SAFETY ENGINEERING
VOL. 99, NO. 4 • APRIL, 1950

The wood shop class at Hastings Junior High School wear safety glasses.

Senior group in Hastings High School wearing safety glasses in the school's machine shop.

Catch 'em Young

One Hundred Percent Safety Goggle Program at Hastings High School, Hastings-on-Hudson, New York

SCHOOL men who have shop courses in the high school curriculum realize the interest which industry has in the possibilities of such courses. They appreciate the generous support that industry gives the school both in taxes and in providing work opportunities for cooperative part-time students and graduates. Everything that the school shop courses can do in the way of forming habits, developing skills, and personal qualities of responsibility counts heavily in the school's favor.

Training and forming habits of safety are now recognized as essential contributions by school shops. At Hastings-on-Hudson high school, a One Hundred Percent Safety Goggle Program was introduced in the school shops this year. In every previous year, there had been several near-serious eye injuries caused by the lodgment of dust or steel particles in eyes. At the end of the first term, no shop student had reported to the nurse or doctor for removal of any foreign substance from his eyes.

Not only students and instructors wear safety goggles through the class period, but the Superintendent and Principal put on safety goggles upon entering the shops. This eye-safety program has resulted in an increasing awareness among students of other hazards about the shops and *(To page 46)*

Driver training car of Hastings High School in readiness for final road test. Left to right: Instructor Clayton W. Blakeslee; William O. Fordham, Examiner, Bureau of Motor Vehicles; Superintendent John L. Hopkins; Sue Lindemann, student; and Principal Rowland H. Ross.

Hastings School Nurse, Florence L. Smith, fitting safety glasses to shop student. Left to right: William Brown; Instructor Clayton W. Blakeslee; Spencer B. Hopping of the American Car and Foundry Co.; Instructor William J. Ploeser; Don Kimball, goggle company representative.

SELECT THE SHIELD

By D. F. WEST,
Product Line Manager,
Personal Protective Equipment Div.,
Mine Safety Appliances Co.,
Pittsburgh, Pa.

NOT even Rube Goldberg's inventive mind could conceive the complicated maze of pulleys, gears, and cog wheels that would protect every worker against every conceivable hazard in every plant. Safety engineers realize that the multiplicity of job problems, complicated by individual physical differences, demand the tailoring of protective devices to each job.

Plastic faceshield wards off flying particles.

When considering the eye and face protection of his men, the competent safety engineer will: (1) analyze the various available protective devices to determine which will most completely protect the worker against a specific hazard; (2) give careful consideration to the comfort of the wearer, as this will aid in determining whether or not the device will be worn; (3) instruct the men in the proper use of the equipment and explain to them its points of superiority to enlist their cooperation; and (4) provide for the inspection and repair of the devices at periodic intervals.

Faceshields

Probably the earliest device of the faceshield-type was the walrus-hide eye protector with small cross slits, used by Eskimos 200 years ago to protect against snow blindness. However, the widespread industrial use of the faceshield is a fairly recent development. Perhaps one reason for its "johnny-come-lately" appearance is the fact that it had to await the development of the durable clear plasties used in the visor.

A faceshield is a simple device consisting essentially of a headgear or band, to which the plastic visor is attached by means of a friction joint so that it may be easily tilted upward and off the face. Until a few years ago, cellulose acetate was the material most commonly used for the visor. British industry pioneered in the widespread use of faceshields of this material. Recently, vinylite plastic has been adapted to use as the faceshield visor. The choice of vinylite or acetate will depend upon the hazard involved, although both offer substantial protection against the hazards of light flying objects and chemical splash. Shields of either material are available in

Mesh screen shields wearer from radiant heat.

Acid hood protects head from dangerous liquids.

FEATURE

This is the first of three feature articles concerned with Eye Protection. The next two articles of the series will be published in the May and June 1950 issues of SAFETY ENGINEERING.

- *Flying Particles*
- *Chemicals*
- *Heat*
- *Radiation*
- *Sand Blast*
- *Metal Splash*
- *Liquid Splash*

TO FIT THE HAZARD

Workers are not receiving the maximum eye and face protection unless their faceshields and helmets have been selected for their particular jobs. Many types are now available for various hazards and there are some startlingly new developments in shield and helmet protection.

varying thicknesses.

Perhaps the faceshield's major advantage over goggles, where the protection required is equal, is the comfort it affords the workmen. Because of the free flow of air around and behind the visor, there is no problem of fogging as sometimes occurs with safety goggles. The rigid, fibre type of headgear proves more durable in use than those using an elastic headband. It is important that this type of headgear be properly designed, so that there are no pressure points.

Heat Masks

For work around blast furnaces, cupolas, heating furnaces, soaking pits, etc., safety engineers have adapted the features of the familiar fire screen which deflects heat. Heat Masks are basically faceshields with the plastic visor replaced by a fine mesh steel screen, to deflect heat away from the wearer and prevent infra-red burns, in addition to increasing the comfort of the worker. Where additional protection is required, 100% wool bibs and snoods are attached to the mask with snap fasteners for neck and upper chest coverage. Masks combining some of the features of the faceshield, welding helmet, and heat mask are in widespread use protecting those working with hot babbitt, zinc, or lead. They protect the head and chest from splashes of these metals in operations such as pouring bearings, socketing wire ropes, etc.

Acid Hoods

Those who must work around acid lines, storage tanks, pickling vats, plating solutions—who handle chemicals in open vessels or who come in contact with products of chemical and refining plants—have all benefited from the development of acid resistant plastics. Safety equipment manufacturers have been quick to develop snug fitting hoods which protect the major portion of the upper body in addition to the face and eyes from acid splashes and sprays. Some of these use natural ventilation through baffled air vents and also have a fitting at the back of the hood to which a compressed air line may be attached to provide additional ventilation.

Air Curtain

An unusual method of facial protection is credited with ending a strike of paint spray workers at a line spray enamel plant. The men had been wearing a path to the doctor's office for the removal of paint globules from the eyes. Although the company tried several alternative methods, the condition

Abrasive airline mask for shot & sand blasters.

Airline hood protects against fine particles.

persisted and finally the men walked off the job, insisting they would not return until the problem had been solved.

A unique device called the "Air Curtain" was installed and tested. The complaints and the walkout promptly ended. Consisting of a circle of light plastic tubing with evenly spaced holes, it is fitted about the rim of the worker's safety hat, so that it will direct a fan shaped stream of air at a slight angle in front of the user's face. The air, from the plants' compressed air system, has sufficient force to prevent rebounding particles or globules of enamel spray or paint from reaching the eyes or face. The device has found widespread use in vitreous enamel plants and production line paint spray operations.

Shot Blasters Protection

Shot and Sand Blasters are in special need of facial protection as they are exposed to the rebound of high velocity particles which are harmful to the face and eyes. In addition, the respiratory system must be protected against the inhalation of the heavy concentrations of harmful and nuisance dusts.

To meet these problems abrasive masks or abrasive helmets are available to afford the combined protection necessary. In most models, long rubber hoods are utilized to protect the face and upper body from impact; and the mask or helmet is supplied with air, reduced to a respirable pressure, from the plant's compressed air system.

The main points considered by the safety director in choosing an abrasive or sand blasting mask or helmet will be: (1) lightness in weight, (2) good visibility, (3) a practical method of protecting the lens from pitting, (4) durability against abrasive particles, (5) balance and other comfort features, and (6) approval by the U. S. Bureau of Mines.

Welder's Helmets

The most common type of facial protection, other than goggles, is the standard welder's helmet. The history, development, and description of the various types of welder's helmets has been more completely covered in an article by Mr. W. L. Bell in the April, 1949 issue of *SAFETY ENGINEERING*. However, there has been a recent development offering protection to welders who must work in toxic atmospheres. This particular condition occurs most often in the repair of tanks and other equipment by acetylene or arc welding. In some cases, even after all explosion and fire hazards have been eliminated, the element of toxicity remains or can be created by the heat of welding. A new mask development by the Safety Department of the Ethyl Corp., in collaboration with representatives of several oil companies and Mine Safety Appliances Company provides, in one unit, protection against ultra-violet and infra-red radiation, impact and pitting, and inhalation of toxic fumes. This welder's facepiece * *(To page 35)*

* A picture of this new helmet and a description of it appear in the "New Products" section of this issue.

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but *you* can't grow new

HANDS AND ARMS

PROTECT THE ONLY PAIR YOU'LL EVER HAVE

A FORMULA FOR FLOOR MAINTENANCE

By ERNEST V. HATCH, Vice President,
Masury-Young Company, Boston, Massachusetts

There is no magic formula for keeping floors clean, bright and slip-resistant, but there is a scientific formula for better maintenance with less drudgery.

SAFE walkways should command as much attention countrywide as almost any other single item. This is particularly true when one considers the number of steps each person takes during a given period, multiplying this by our population, and then remembering that each step is a potential fall. To provide slip-resistant floors, is a real problem faced by those responsible for every building in the country. Fortunately today there are some answers.

Of course, it is a relatively simple matter to have safe walkways: just don't have floors! But with modern industry, merchandising and living demanding better and better floors, we must provide surfaces that are safe under foot, gleaming in appearance, and give light reflections so as to improve working conditions or enhance the beauty of interiors or displays.

Not only is there the problem of appearance, there are also many conditions where control of dust is a vital factor. Aside from the fact that in many industries and businesses dust is a costly and ruinous factor, we are also faced with the effect of dust on the human being. Constantly subjected to dusty conditions, the respiratory system through irritation is susceptible to infection. By controlling this dust problem, we can decrease absenteeism and increase efficiency.

As an example, several years ago, the writer made a survey of retail establishments before and after a system of dust control was installed. It was found during the Christmas rush that invariably there were quite a few employees absent because of respiratory ailments. It naturally was assumed that fatigue and crowded working conditions were the underlying causes. But, there was also another enemy. This was Dust.

After a system for controlling dust was introduced, there were by far fewer employees ill, and more who could enjoy the holidays. In a retail store where they would experience eight to twelve on the sick list before proper floor care, the number of absentees was cut to two to four. Quite a recommendation

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FEATURE

This is the second of a consecutive series of three major articles dealing with Plant Sanitation. The next feature of the series will appear in the May 1950 issue of SAFETY ENGINEERING.

that management give thought to proper floor care!

Floors, floorings, or floor coverings, as you may choose, represent big investments. As such, they must be protected. Protection involves not only preservation but economy of treatment and daily care so as to bring out the true colors, warmth and beauty of the floor itself. After all, we spend the time, money and energy to develop these surfaces for the same reason that we groom and clothe ourselves. That is, for the other person, primarily.

It is your privilege to treat, care for and dress your floors as you see fit. But, you do owe an obligation to the invitee or worker. He rightfully expects to use walkways that are properly treated and are free of foreign matter or of negligent maintenance.

Types of Floors

So, in considering floors, there is first the proper floor for each condition. This is predicated on selection of one of many types to suit your needs, plus, of course, the dollars in the construction budget. Then we have preservation of the floor with materials that are proper for the kind or type of flooring. And last, but by far not least, the regular or daily care, remembering that labor and not material cost is the big factor in floor maintenance.

With the above in mind, let us examine briefly the several general types of floors with a view toward simplifying as much as possible their treatment and care.

Fundamentally, there are 3 types of floors: 1. Wood; 2. Vitreous; 3. Resilient.

Each of these breaks down to a speeific kind of wood, vitreous material or resilient surface, but there is generally a pattern of proper care covering all floors. This formula is:

A. Treatment
   1. Preparation
   2. Application of treatment material

B. Dressing
   1. Preparation
   2. Application of dressing

C. Maintenance
   1. Daily
      a. Sweeping
      b. Mopping or cleaning
      c. Buffing
   2. Periodic
      a. Cleaning
      b. Re-dressing

D. Re-treatment (when and if necessary)

In Chart I, these elements forming the proper care of floors are summarized for each of the three general types of floors.

By way of explanation, we bracket the various floorings under the three headings used above, viz:

1. Wood—All kinds of wooden floors.

2. Vitreous—Cement, Magnesite or Oxychloride cement, Ceramic and Faience tile, Quarry tile, Terrazzo and Marble.

3. Resilient—Asphalt tile, Linoleum, Linoleum tile, Rubber, Cork, Mastic and Vinyl or Plastic type.

It is not the purpose of this article to discuss the relative merits of various floors. It is assumed that the buyer has made his choice of the proper floor for his particular need.

Let us assume at this point that the floors have been properly treated and we are faced with their up-keep. This is the big problem.

Care of Wood Floors

Wood floors can be easily maintained by daily dust mop sweeping and periodic buffing with steel wool. An ideal material for protection of wood floors is one that acts as a solvent of previous coats leaving a new finish. This eliminates excessive sanding of the floor. In any event regardless of the material you choose it should first sub-surface seal the floor.

Another important point regarding wood is to use little or no water. This will cause swelling or buckling and ultimately takes the life out of the wood.

Care of Vitreous Floors

In the group of vitreous floors, those which are very dense, such as Quarry and Ceramic tile, should not be sealed. Just mop regularly using a good neutral vegetable oil soap.

Cement and Oxychloride floors very frequently *(To page 43)*

Chart I—Care of Various Types of Floors

	Treatment		Dressing		Maintenance		Remarks
	Preparation	Application	Preparation	Application	Daily	Periodic	
WOOD	Sanding	Apply Sealer Steel Wooling after each coat	Sweep dust-free with wide dust mops	Apply dressing or finish and burnish or buff	For most floors sweep with wide dust mops treated with a mop dressing	Buff with steel wool if necessary. Some finishes require only traffic for buffing	Re-treat as needed—Some treatments do not require sanding
VITREOUS	Scrub and rinse	On porous floors apply proper sealer	Most instances none required	Most instances none required	Same as above	Scrub with neutral soap	Appearance impresses through proper mopping
RESILIENT	Most instances none required		Scrub with neutral soap	Apply only dressing removable by water solution	Same as above	Dry buff with steel wool—or mop with neutral soap solution	Strip finish and re-dress as needed

How to Handle and Store Metal Drums Safely

The following article is a reprint of a manual, "Handling and Storage of Metal Drums for Liquids (Single Trip)," published by the Manufacturing Chemists' Association. Copies of this manual, which is one of their many valuable bulletins dealing with chemical safety, are available from the organization's headquarters in Washington, D. C.* Readers interested in the I.C.C. specifications for the single-trip metal drum are referred to the article "How to Ship Chemicals Safely" by G. W. Benbury in the January, 1950 issue of SAFETY ENGINEERING.

General

(a) Steel drums conforming to I.C.C. Specification 17C are authorized for the shipment of Class B poisonous liquids and all flammable liquids [1] regardless of flashpoint, provided vapor pressures of the liquids do not exceed 27 pounds per square inch, absolute, at 100°F. (Reid test). They are used extensively for shipping products with flashpoint of 20°F. or below.

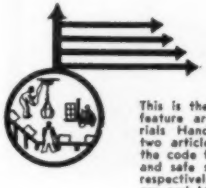
(b) Steel drums conforming to I.C.C. Specification 17E are authorized for shipping Class B poisonous liquids and other liquids with flashpoint above 20°F., provided their vapor pressures do not exceed 16 pounds per square inch, absolute, at 100°F. These containers are also authorized for *full carload or full truckload* shipments of flammable liquids with flashpoint of 20°F. or below, provided their vapor pressures do not exceed 16 pounds per square inch, absolute.[2]

(c) Non-dangerous liquids, including those with flashpoint higher than 80°F., are generally shipped in drums conforming to Section 5(c) of Rule 40, Consolidated Freight Classification.

(d) While the recommendations contained herein apply equally to the handling of all metal containers holding poisonous, flammable, combustible [3], and non-dangerous liquids, they are especially adapted for the extensively-used I.C.C. Specification 17E container of which many millions are utilized each year for shipping alcohols, solvents, paints and related products.

(e) In ordering specification containers, shippers must make certain the containers comply in all respects with I.C.C. or C.F.C. requirements. Drum suppliers should be advised regarding nature

FEATURE



This is the third of three feature articles on Materials Handling. The first two articles, dealing with the code for power trucks and safe slings, appeared respectively in the February and March 1950 issues of SAFETY ENGINEERING.

* Requests for copies of the manual should specify "Manual Sheet D-33" and should be addressed to the Manufacturing Chemists' Association, 608 Woodward Bldg., Washington 5, D. C. The price is 20 cents per copy.

[1] The Interstate Commerce Commission's Regulations for the transportation of explosives and other dangerous articles define an inflammable liquid as any liquid which gives off inflammable vapors (as determined by flashpoint from Tagliabue's open-cup tester, as used for test of burning oils) at or below a temperature of 80° Fahrenheit. While the term "inflammable" is used by the I.C.C., the preferred form "flammable" is used in this manual.

[2] This paragraph refers primarily to the 55 gallon container with 18 gauge sidewall. For modified requirements relating to drums of lesser capacity, consult the I.C.C. Regulations.

[3] A classification adopted by the U. S. Coast Guard, applicable to liquids with flashpoint (open cup) at or below a temperature of 150°F. and above 80°F.

of the lading, in order that suitable drum seaming compounds, gaskets and exterior finishes (paint or lithography) will be furnished.

Receipt of Empty Containers

(a) **Handling.** Do not drop drums. Use inclined rails or a skid to unload them from railroad car or truck. Empty drums may be handled either in an upright or horizontal position, and may be rolled on their rolling hoops. Care should be used when rolling drums to prevent marring the exterior finish.

Fig. 1. Outdoor storage of empty drums on pallets.

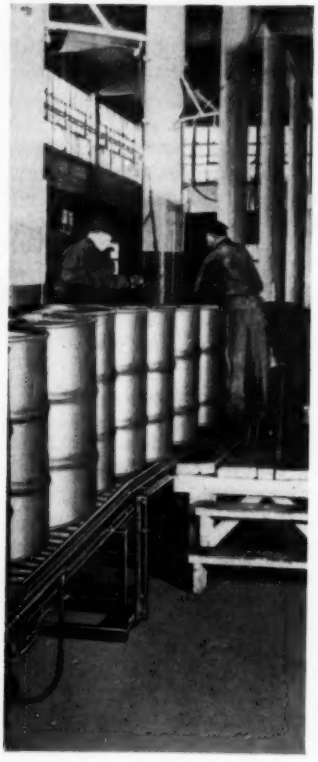


Fig. 2. Examining empty drums prior to filling.

(b) **Storage.** Store under cover whenever possible to protect the appearance of the drums. Be sure bungs are tight in order to exclude moisture which otherwise might corrode the interior surfaces.

When stacked upright, heads should be interlocked by (1) staggering the tiers (see illustration on p. 23) or (2) inserting dunnage between the tiers.

If necessary to store outdoors, drums should be placed on their sides with bungs down. They should be kept off the ground with dunnage, preferably 2x4-inch timbers. Drums in the bottom tier should be securely blocked. They may be tiered as high as it is practical to pile them—reducing the number by one drum for each successive tier. A tarpaulin covering the pile will help to protect the finish.

Drums may also be stored outdoors on pallets, as shown in Figure 1.

General Precautions

(a) **Buildings.** Buildings which house filling or emptying operations involving flammable liquids should be constructed and equipped with proper safety facilities and devices. The buildings themselves should be of substantial construction with adequate exit facilities. Ample ventilation should be provided.

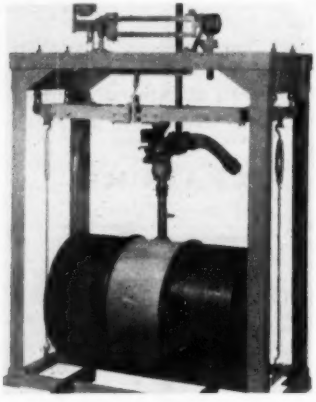


Fig. 3. Filling equipment with scale attachment.

(b) **Electrical Fixtures.** All electrical work in buildings should be in accordance with the National Electrical Code. Electric lights, plugs, motors, wiring and controls within buildings should be explosion-proof.

(c) **Floors.** Floors should be of any appropriate material provided the surface is non-sparking and conductive, and should have adequate drainage facilities.

(d) **Fire Fighting Equipment.** Approved chemical fire extinguishers, foam generators, or other approved extinguishing agents should be immediately available, and employees working in the building should thoroughly understand how to use such equipment.

(e) "NO SMOKING" signs should be prominently displayed throughout the handling area, and the rule against smoking strictly enforced. No flame of any kind should be permitted within the buildings.

(f) **Grounding.** Drums and unloading (emptying) equipment should be electrically interconnected and grounded to prevent the accumulation of static, whenever the product being handled warrants it.

(g) **Tools.** Use of non-sparking tools is recommended within the vapor area during loading and unloading operations.

(h) Buildings should be kept clean, and door openings free from obstructions. Approved metal receptacles with tight covers should be provided for the storage of oily waste and rubbish, and the contents of these receptacles should not be permitted to accumulate.

Filling

(a) **Inspection of Drum Interior.** It is important that empty

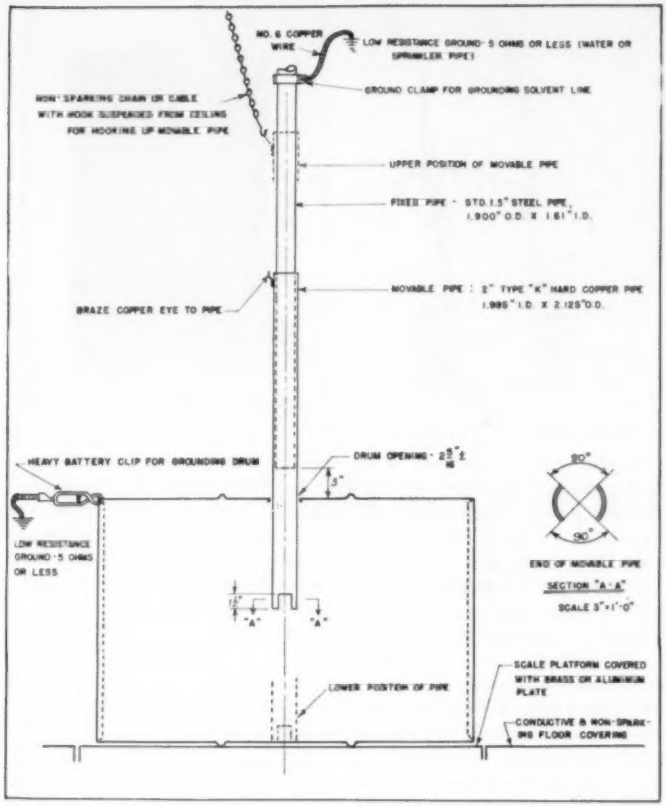

NO. 6 COPPER WIRE
LOW RESISTANCE GROUND: 5 OHMS OR LESS (WATER OR SPRINKLER PIPE)
GROUND CLAMP FOR GROUNDING SOLVENT LINE
NON-SPARKING CHAIN OR CABLE WITH HOOK SUSPENDED FROM CEILING FOR HOOKING UP MOVABLE PIPE
UPPER POSITION OF MOVABLE PIPE
FIXED PIPE - STD. 1.5" STEEL PIPE, 1.900" O.D. X 1.61" I.D.
MOVABLE PIPE : 2" TYPE "K" HARD COPPER PIPE 1.995" I.D. X 2.125" O.D.
BRAZE COPPER EYE TO PIPE
HEAVY BATTERY CLIP FOR GROUNDING DRUM
DRUM OPENING - 2 3/8" ±
3"
LOW RESISTANCE GROUND - 5 OHMS OR LESS
90°
90°
END OF MOVABLE PIPE
SECTION "A-A"
SCALE 3"=1'-0"
"A"
"A"
SCALE PLATFORM COVERED WITH BRASS OR ALUMINUM PLATE
LOWER POSITION OF PIPE
CONDUCTIVE & NON-SPARKING FLOOR COVERING

Fig. 4. Filling arrangement with adjustable filling pipe, showing recommended grounding hookup.

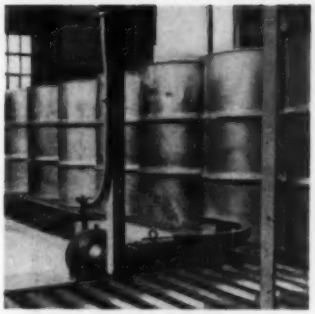


Fig. 5. Powered roller conveyor.

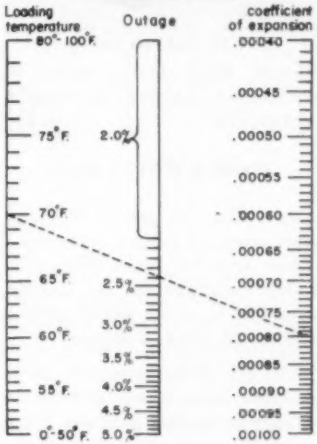


Fig. 6. Outage Chart for Flammable Liquids. Example: Suppose the temperature of the liquid at time of loading is 70 degrees F. and its coefficient of expansion is .00080; lay a ruler on the chart running from 70F to .00080 as shown by the dotted line and the required outage is 2.4 per cent where the ruler crosses the outage scale.

drums be clean and free from foreign matter that might otherwise contaminate the product. A small vapor-proof electric bulb may be used for interior inspections (See Figure 2).

(b) **Grounding.** Electric grounding between drums and filling equipment should be provided, whenever the product is of flammable nature.

(c) **Equipment.** Drums may be filled automatically by weight or by volume utilizing commercial equipment. Recommended types of filling devices are shown in Figures 3 and 4. It is more economical to fill through a head opening. Handling to and from the filling equipment is best accomplished by use of powered or gravity roller conveyors (See Figure 5). Scale or other filling platforms should be equipped with non-sparking surfaces.

(d) **Outage.** Sufficient vacant space (outage), calculated to the total capacity of the container, must be provided to prevent possible leakage or distortion due to expansion of the contents from increase in temperature. The outage chart (Figure 6) is reproduced from the I.C.C. Regulations, which should be consulted for complete details:

(e) **Weight Limitation.** It is recommended that not over 300 pounds net weight of product be shipped in the 30 gallon drum of all-20 gauge construction, and not over 550 pounds net weight in the 55 gallon drum of all-18 gauge construction. For 55 gallon drums with 20 gauge sidewall, a maximum net weight of 450 pounds is recommended.

(f) **Closures.** Bung gaskets must fit and seat properly and be fabricated of a material impervious to the lading. The conventional pressed-in spuds and stamped plugs, of which there are several types on the market, are adequate leak-proof closures if properly applied. The added use of cap seals provides a secondary seal as well as a tamper-proof closure.

Plugs are usually tightened with hand wrenches of special design supplied by the closure manufacturer. All-purpose wrenches which may be used with most types of plugs are available. Care should be exercised to apply proper tension when tightening plugs. The amount of tension will vary with different gasket materials.

(g) **Inspection.** After plugs have been tightened, but before moving to loading platform or

Fig. 7. Two-wheel hand truck—Type I

Fig. 8. Two-wheel hand truck—Type II

Fig. 9. Drum Dolly.

storage, filled drums should be checked for leakage at the closures and chimes.

Handling of Filled Drums

(a) While 55 gallon, 18 gauge steel drums are built to withstand a 4-foot drop test when filled, they should nevertheless be handled carefully to avoid undue stresses and should never be dropped.

(b) Filled drums may be rolled on their sides if the distance to storage or loading platform is not great. For greater distances, drums should preferably be transported on gravity or powered roller conveyors (Figure 5), pallets (Figure 10) or hand trucks (Figures 7, 8 and 9). Various lifting devices are available for up-ending filled drums. Grappling hooks are also available where hoists are used. Names of suppliers will be furnished on request.

(c) **Storage.** Filled drums should be kept away from heat or direct rays of the sun, as the containers are not pressure vessels and should be protected against conditions which tend to create internal pressure. Storage should be under cover, preferably indoors; in a cool, well-ventilated area, free from dampness and direct heat, as shown in Figure 10.

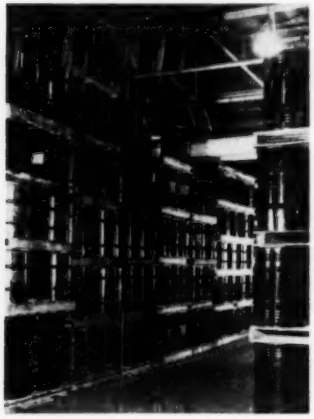


Fig. 10. Storage of filled drums on pallets.

Shipping

(a) **Inspection.** All filled drums should be carefully checked for leakage and tightness of closures by visual inspection or check-weighing.

(b) **Labels and Markings.** All labels and markings should be in legible condition.

Each drum containing dangerous liquids must bear the standard I.C.C. warning label (See I.C.C. Regulations for full carload and full truckload exceptions).

In addition, use of the appropriate caution label as set forth in M.C.A. Manuals L-1 and L-2 is recommended.

The use of water-proof adhesives for labels, and water-proof and fade-proof inks for stencil markings is recommended.

A clear lacquer overcoating will protect both labels and stencils.

(c) **Description.** Each shipment should be properly described in shipping papers in accordance with requirements of the Interstate Commerce Commission and the Consolidated Freight Classification.

Emptying

(a) Before removing closure, substantially support the drum, and block it to prevent movement.

(b) Filled drums should be opened carefully to avoid damage to closure and to prevent possible spray of contents in case drums are under internal pressure.

To remove body plug, use a pipe wrench or plug wrench with a long handle. Face away during this operation. After plug starts, give one full turn to permit internal pressure to vent. Then only should plug be loosened further or removed.

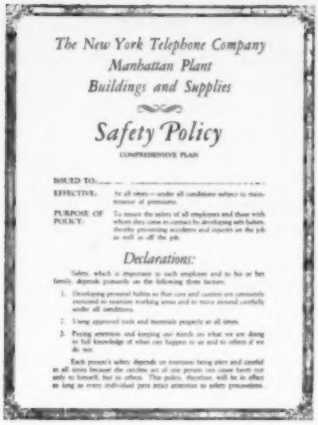
Non-sparking tools should be used for opening and closing the drums.

(c) Gravity methods or a suction pump should be employed to discharge the contents of drums. *Pressure should never be used.*

If faucets are used, it is recommended that they have short shanks threaded with standard *straight* iron pipe threads, and that a resilient gasket of suitable material be provided to insure a tight fit (See M.C.A. Manual Sheet D-32).

The use of a portable tilting and emptying device facilitates the

(Continued on page 50)



The New York Telephone Company
Manhattan Plant
Buildings and Supplies

Safety Policy

COMPREHENSIVE PLAN

ISSUED TO: _____

EFFECTIVE: At all times—under all conditions subject to maintenance of premiums.

PURPOSE OF POLICY: To insure the safety of all employees and those with whom they come in contact by developing safe habits, thereby preventing accidents and injuries on the job as well as off the job.

Declarations:

Safety, which is important to each employee and to his or her family, depends primarily on the following three factors:

1. Developing personal habits so that care and caution are consistently exercised to maximize working areas and to move around carefully under all conditions.
2. Using approved tools and materials properly at all times.
3. Paying attention and keeping our minds on what we are doing so full knowledge of what can happen to us and to others if we do not.

Each person's safety depends on exercising being alert and careful at all times because the careless act of one person can cause harm not only to himself, but to others. This policy, therefore, will be in effect as long as every individual pays strict attention to safety precautions.

Provisions:

Tools — Provision: Examine each tool before using and make at least a monthly tool check.

Materials — Provision: Order only approved material and exercise all economy.

Ladders — Provision: Make these checks each time a ladder is used.

Motor Vehicles — Provision: Know the Motor Vehicle Driver's Manual and give full attention to the job of driving safely.

Safety Devices — Provision: Use as required on all times under all conditions.

Animals — Provision: Read, observe and put into practice the safety suggestions which appear in bulletins, posters and safety items outlining what they are for your safety.

Reporting — Provision: Report accidents promptly to the state of proper attention and care. Not all accidents result in injuries but whether injuries result or not, they each a reason to safety. Knowing the facts of accidents eliminates a disposition to prevent occurrence and reports should indicate necessary facts.

Off The Job — Provision: Use check lists supplied by the Company from time to time in addition to the Safety Cards to cover conditions generally found around the home or other locations off the job.

Health — Provision: Have the fire weather, observe misdemeanor others, including to continue; also write each day, get sufficient rest, avoid worry and develop a wholesome attitude toward living.

Treatment of Injuries — Provision: Qualify for a valid first aid certificate.

ONLINERS ASSUR WHEN SOMEONE FAILS TO PAY HIS SAFETY POLICY PREMIUMS.

PREMIUMS

ASSURANCE

I agree to the above provisions, including the premiums and further agree to uphold the Bell System Safety Creed. The gift is an inspiration and an attitude as we suggest that we observe safe rules to prevent our work safety and by signing my name in the space provided below to keep this statement of the Manhattan Buildings and Supplies Safety Policy effective it will entitle me to the benefits of my obligation to extend my family and me.

I confess that safety pays and that an accident is no bargain.

Signature of employee: _____

Date: _____

Countersigned: _____

Superintendent of Buildings & Supplies

Signature of supervisor: _____

Date: _____

Safety Is the Best Policy

By JACK COST,
Division Plant Personnel Supervisor: B & S,
New York Telephone Company, New York City

In a unique plan used by the New York Telephone Company to interest its employees in accident prevention, it is literally true that "Safety Is the Best *Policy*!"

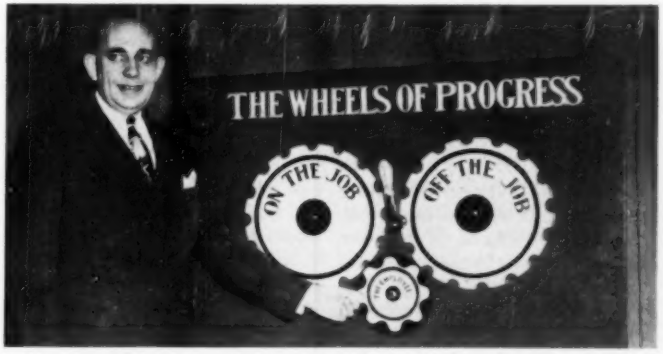
RESEMBLING in every respect a bona fide insurance contract, the New York Telephone Company's "Safety Policy" urges employees to observe the rules of safety both at home and on the job. Policy "premiums" are hints on avoiding accidents.

The idea of a printed "Safety Policy" was originated during discussion of a 1950 safety program by the headquarters staff of the Buildings and Supplies Force of the New York Telephone Company, Manhattan Plant Department. The Force, made up of 1,600 men and women, does a number of jobs including building operation and maintenance, supply storeroom care, and motor vehicle operation.

Superintendent S. E. Stromberg outlined the need for employee support of any program, and stated that any safety program to be developed should appeal to all employees under all conditions—off the job as well as on the job. An employee injured away from work, he pointed out, is absent from work exactly as one who is injured on the job. "If our overall safety program could be put into printed form and become general knowledge," he said, "we would have a better chance of persuading employees to apply it."

A resemblance between items of the Force's accident prevention program and those of a life insurance policy was noted by the group. It was decided that the resemblance could be emphasized advantageously as an interest capturing feature. Thus originated, the document that looks and reads like an insurance policy, but is actually a statement of a sound concept of safety under all conditions—in short, a "Safety Policy."

Printed in Bell System blue ink with an occasional line in red, the



Superintendent S. E. Stromberg points to a display which demonstrates graphically the effect of an accident on the wheels of progress both on and off the job. The monkey wrench, labeled "accidents," jams the movement—and the employee's performance at home and at work is brought to a sudden halt.

Safety Policy, at first glance, appears to be a bona fide insurance contract.

Accident Insurance Premiums

Provisions and "premiums" customarily found in insurance policies, are indicated, but here the listed "premiums" are actually precautions costing only time, interest and effort by policy holders. Three safety rules are listed on the cover: development of safe habits, use of approved tools and materials, and attention at all times to what is being done. Frequent harm to others caused by one person's carelessness is emphasized, as well as the harm a person can do to himself through unsafe actions.

Space is provided for the signature of the employee, as in a genuine insurance contract, and his supervisor. The employee retains the paper as a reminder of his obligation to live up to the provisions. To further the resemblance to an actual insurance contract, the Safety Policy is enclosed in a cellophane window envelope.

Further emphasis is given to the safety program by the supervisor who must explain the value of employee support of the program to an employee in order to obtain his signature on the Safety Policy. In other words he must "sell" the employee on the value of subscribing to a sound policy of safety.

Other Aids to Safety

As additional help in discussion of the safety program, a display which illustrates how accidents are "monkey wrenches in the wheels of progress" has been created. The display was effectively used recently at a 1950 safety program meeting of all Buildings & Supplies supervisors. It demonstrates that the normal activity of an employee keeps the wheels of progress revolving, on the job and off, but that both are affected by anything at all which impedes an employee's performance. The introduction of a monkey wrench marked with the word "accident" jams the movement of the gears, graphically and dramatically illustrating the point.

Other features of the Manhattan Plant, Buildings and Supplies Force's 1950 safety program include the streamlining and rearranging of the Safety Observation Plan to a more positive Safety Improvement Plan, which fosters corrective action to prevent accidents rather than noting the occurrence of unsafe acts.

The Bell System policy, expressed in the slogan "No job is so important and no service is so urgent that we cannot take time to perform our work safely," is that *accident prevention*, not *accident investigation*, is the desired result of safety programs and safety personnel activity. To that end, the Force is making provisions to create a closer day-to-day relationship between safety supervisors and field supervisors in matters of accident prevention so that they will work as a team.

The 1950 safety program contains the usual safety committee fixtures: news letters to the field from the staff, bulletins on special subjects, reminders and joggers—but overall stimulation is expected from extra supervisor activity in "selling" the Safety Policy and making it stick by original and follow-up action.

The Safety Policies are being well received, and, as a new approach with unusual interest in a field where innovations are not easy to devise, they are getting more than casual attention.

Pictures by courtesy of the New York Telephone Company.

New Safety Products for April

Plastic Cover Plates
Vacuum Cleaner
Extinguisher Labels
Barrel Truck
Summer Safety Shoe
Welding Mask
Handpad
Chemical Resistant Fabric
Safety Innersole

See pages 70–71

Industrial Vision

EIGHT high-ranking industrialists and other notables were among those describing various methods and procedures for personnel testing in vision programs at the second annual Southeastern Industrial Vision Congress, at Atlanta.

More than 165 Optometrists, industrialists, educators, health officials and guests attended the meeting held on the Georgia Tech campus. It was sponsored jointly by the Associated Industries of Georgia, the Engineering Extension Division of Georgia Tech, and the Georgia Optometric Association.

The program included sections on illumination, color, as well as vision testing and correcting.

Sight Program

G. Luther Weibel, Jr., personnel Director, Magnet Mills, Inc., Clinton, Tenn., speaking on "Initiating a Vision Program," told the Congress that it is a program "which enables us to rehabilitate our skilled employees, and it improves the quality of their work, and it greatly reduces absenteeism." He also said that the program reduces accidents, and saves hundreds of thousands of dollars a year in training costs.

Other speakers from industry included B. G. Byron, Clearwater Finishing Mills, Old Fort, N. C.; Frank H. Emerick, Southern States Iron Roofing, Savannah; and C. T. McNary, Personnel Director, Blue Bell, Inc., Greensboro, N. C. The keynoter was Dr. Matthew Luckiesh, Cleveland, Ohio, General Electric Co.

Speaking on "Color Conditioning," S. W. Quisenberry, E. I. du Pont de Nemours & Co., offered industrialists an excellent pattern for safer and more restful working conditions. George J. Taylor, St. Louis, Mo., Day-Brite Lighting, Inc., stressed the importance of good illumination and pointed out the 80 per cent of the workman's actions are eye-controlled.

Left—Interior view of the wreckage in the Holland Tunnel Fire.

Exterior view, Holland Tunnel (New York) Fire, showing burned motor vehicles hauled from tunnel.

Part 2

FLAMING METAL!

By ARNOLD A. WEINTRAUB, B.S., (Ch.E)

How fire-proof is structural steel?
What are the explosion hazards in heat-treating?
How can magnesium be machined safely?
What are the hazards in the use of aluminum?

(This is a continuation of an article the first half of which appeared in the March, 1950 issue of SAFETY ENGINEERING.)

Iron and steel, too, have their attendant fire problems. Like other metals, the danger is increased when the particles are small. The National Board of Fire Underwriters reports a fire in a massive 2,400-ton pile of oily steel borings and turnings. The metal had been stored for two years. When it was transported and unloaded, evidence of heating was discovered. Realizing that water might be dangerous, instructions for fighting the resulting fire were requested. No other property was exposed. Steam was suggested but none was available. Another proposal, deemed too costly, was to cover the pile with clay and send a stream of carbon tetrachloride into an opening. After some experimenting, a clamshell bucket unloader was used to scoop up about 3 tons of the material (carbon dioxide was continuously played on the bucket and turnings) and drop it some distance from the burning mass. As each load was dropped, a snow plow tractor spread the turnings and a long fog nozzle applied carbon dioxide. After that the pile was cooled with water. When the entire mass had been treated and the original pile was well dispersed, water was used for a whole day and the fire was extinguished. The fire was fought for 50 hours. It took 5 tons of carbon dioxide and 600,000 gallons of water to do the job.

While structural sections of iron and steel will not actually burn, their behavior *(To page 40)*

Staten Island Ferry Terminal Fire, New York City. Collapsed ruin after the fire shows the effects of intense heat on the unprotected steel girders.

Another view of the unprotected steel structural members twisted out of shape by the intense heat of the Staten Island Ferry Terminal Fire in N. Y.

TRANSPORTATION

Free Diesel Courses

FREE training courses on diesel-powered trucks and buses are being offered by the Mack Truck Company, it is announced by H. W. Dodge, executive vice president.

"There is a mounting need and opportunity for trained diesel mechanics everywhere, due to the rapid shift to diesel power in trucks and buses," Mr. Dodge pointed out in making the announcement.

"To fill this need—and to help the trucking industry in the diesel-powered field—Mack is establishing these training courses in diesel truck and bus maintenance in over sixty cities throughout the country," he added. "Many experienced mechanics think that the diesel engine is very complicated, difficult to maintain and that their present gasoline engine experience is valueless should they decide to learn diesel maintenance. To "take the mystery out of the Diesel" and to show that a competent gasoline engine mechanic can, with a relatively small amount of training, become an equally competent diesel engine mechanic is Mack's aim in establishing these courses."

Eligible for enrollment in these free diesel courses are truck owners, maintenance superintendents, shop foremen, garage or service station mechanics, and persons employed in any capacity allied to the maintenance or operation of trucks and buses. Highly qualified diesel engineers and instructors staff these diesel courses. Sessions run two hours one evening a week for ten weeks, with as many repeat terms as the number of applicants in any city warrants. Certificates are awarded to those satisfactorily completing the course.

Already initiated in Boston, Albany and New York City, these courses have elicited tremendous response from transportation and trucking circles, reports Mr. Dodge.

Heralded in each case by local newspaper advertisements, they drew applicants far in excess of the number expected. With nearly 1000 enrolled in the Boston course and 200 in Albany, Mack's New York City course opened with a mammoth student body of 3700. "Thus, when these first three courses are completed, some 5000 men will have demonstrated their willingness to give up their evenings to broaden their education and increase their earning power," commented Mr. Dodge. "They will be able to face a diesel engine with confidence."

Dates have already been announced for openings at Southern and Midwestern points and schedules are being arranged for a steady progression of courses from coast to coast.

Traffic Engineering Fellowship

THEODORE M. MATSON, Director of the Bureau of Highway Traffic at Yale University, has announced that applications are now being received for ten Graduate Fellowships for the study of Traffic Engineering during the year 1950–51. Nine of the ten Graduate Fellowships are made available each year through a grant from the Automotive Safety Foundation and the tenth was established by the American Transit Association. Each of the Fellowships provides approximately $1,400 to cover living expenses and tuition for one year, as well as a stipend for individual research projects.

"The problems of traffic accidents and congestion with the growing demand for automotive transportation are challenging the states and cities of this nation," Mr. Matson said. "There is a genuine need for the application of special engineering skills to cope with the planning, design and operation of traffic facilities."

Mr. Matson explained that the awards are open to men who have been granted a degree in some branch of engineering from an accredited college. He added that preference will be given those now employed in street and highway engineering.

The curriculum for the coming year includes the following courses: Highway Traffic Characteristics; Highway Traffic Regulations, Traffic Design, Traffic Planning, Traffic Administration and Practical Traffic Problems. In addition, each student is required to develop a report based on research, which indicates his capacity for advanced work and represents a contribution of original value in highway traffic.

A special form for Fellowship application and additional information may be obtained by writing to the Director, Bureau of Highway Traffic, Strathcona Hall, Yale University, New Haven 11, Conn. The closing date for applications is June 1, 1950.

Safe Driving Awards

FOUR truck drivers at Eastman Kodak Company's Kodak Park plant received top awards for 24 years' safe driving at the third annual awards dinner held recently. Awards were also made to all drivers with safety records of a year or more.

William Kingston, Harry Marshall, Fred W. Muselow and Otto R. Neubeiser were honored for driving since 1926 with no reportable accidents or accidents in which they were held responsible.

SAFETY

Preventive Maintenance for Drivers & Mechanics

By THEODORE McGILL
District Superintendent
Department of Sanitation
City of New York

EVERY Fleet Supervisor is seeking maximum safe transportation in the operation of his vehicles at lowest possible cost. Preventive maintenance is a fundamental step in this direction. The following are the main values of preventive maintenance:

1. There will be more assurance that the vehicle will be able to get to its destination safely under extreme conditions of weather, terrain, and load.
2. The vehicle will seldom be held up for emergency repairs.
3. The life of the vehicle and of its parts will be prolonged.
4. There will be less physical and mental strain on the driver.
5. The possibility of accidents caused by mechanical failures will be reduced to a minimum.

Preventive-maintenance systems are not all alike in regard to details, but their purpose is the same: to provide a means of thorough inspection at regular intervals for the purpose of detecting mechanical trouble at the outset and correcting it before it has a chance to develop into a costly damage.

Responsibilities for Preventive Maintenance

In general practice, the supervisor's responsibilities usually include the following:

1. Co-operating with management in the proper selection of vehicles appropriate to the needs of the organization. This includes consideration of factors such as maintenance and repair costs, grade-ability, appearance, quantity and quality of personnel necessary for satisfactory operation, structural strength, and power and speed relationships.
2. Organizing or conducting a practical, efficient preventive-maintenance program that is suited to the vehicles of the company and their operation. Factors to be considered are how, what, when and where vehicles are to be serviced.
3. Planning and guiding the work of mechanics. This includes such factors as the issuance of verbal and written instructions, the setting up and maintenance of a record system covering repairs, tools, parts and materials, plant housekeeping, labor relations, mechanic training, new developments in repair procedures, equipment and tools, cost and quality of repairs, and shop testing and road testing of vehicles.
4. Co-ordinating the procedures and personnel involved in preventive maintenance. This includes consideration of many factors, such as shop practices, costs, driver's responsibilities, mechanic's responsibilities, new developments, training, maintenance, equipment, regulations, forms and records, personnel supervision, and the revision of maintenance procedures.

The selection of the number and kinds and records to be used should be determined by the supervisor in the light of the nature of his operation and the needs of his company. Among those in general use are: preventive-maintenance check lists for drivers and mechanics, "Repair Orders," "Driver's Daily Trouble Report," "Vehicle Parts Requisition Sheet," "Driver's Daily Inspection Sheet," "Mechanic's Work Sheet," "Summary of Repair Costs," "Vehicle Performance Reports," "Road Call Memorandum," "Fuel, Oil, Grease and Tire Records."

Driver's Responsibility for Preventive Maintenance

Almost all motor-vehicle failure is progressive, and many of the troubles that lead to eventual breakdown can be discovered and reported by the driver. Company policy varies with respect to the amount of responsibility for preventive maintenance that is given to the driver. In nearly all cases, company policy does not permit drivers to make repairs; in many locations, even minor repairs are not permitted by union contract. There is, however, general agreement among commercial-vehicle fleet supervisors and owners that a driver should understand the fundamentals of the mechanical construction and operation of his vehicle, realize the importance and

value of preventive maintenance, and assume certain simple duties that are essential to the effective functioning of a program of vehicle conservation.

In addition to the important consideration of driving skillfully so that the vehicle is not abused and its life is extended in terms of time and service, the preventive-maintenance responsibilities of the driver are usually the A inspection service, consisting of a "before-operation" check, a "during-operation" check, and an "after-operation" check. Each of these checks requires that the driver note certain vehicle conditions and report them in accordance with company policy.

Mechanic's Responsibility for Preventive Maintenance

A number of important responsibilities in preventive maintenance are usually assigned to the shop mechanic. In most large organizations, these responsibilities consist of:

1. Performing B, C, D, or E maintenance services as indicated.
2. Making such inspections, adjustments, or repairs as are called for by the "Driver's Daily Report."
3. Making and keeping adequate repair records.
4. Shop testing or road testing all repairs before the vehicle is put back into service.
5. Making all tests, inspections, adjustments, and repairs, whenever possible in conformity with the recommended procedures and standards of manufacturers' specifications and S.A.E.-O.D.T. Standard Practice Instructions.

From an address presented at the 19th Annual Greater New York Safety Convention.

Types of Maintenance Service

(A) maintenance service. The A service is designed to cover the items and work normally required every day or each time the vehicle is garaged. It includes all servicing operations, such as fuel, oil, water, light inspection, and the testing of some items.

(B) maintenance service. The B maintenance service is primarily designed to fit the lubrication period. There are a number of adjustments and tests that fit in B maintenance service. The kind of lubricant used, design of the equipment, and operating conditions all affect the interval between B maintenance-service period.

(C) maintenance service. The C maintenance service includes, in addition to the function of B, most of the adjustments, and tests, plus a heavy or physical inspection with repairs. It may involve replacement in order to obtain necessary adjustments or test results. (The success of any preventive maintenance and inspection procedure depends not merely on finding the defect, but on the correction, adjustment, or replacement in time so that man hours and materials can be saved.) The time required for C maintenance service depends upon the vehicle design, the shop equipment, special tools, and working conditions. It is practically impossible to make a satisfactory inspection of many parts until they have been thoroughly cleaned; adequate chassis-cleaning equipment is very important.

(D) maintenance service. The D maintenance service is designed to cover more extensive repairs, such as replacement of piston rings, engine-bearing adjustment, heavy unit replacement, in which more time and equipment is required than on C service. The interval between D maintenance-services periods will vary considerably, and it is recommended that the vehicle be assigned to D service as a result of tests made in C service which indicate that valves, rings, or bearings are worn to the point that the vehicle has lost power or operating efficiency.

(E) maintenance service. The E maintenance service is the period at which time the engine is removed, completely disassembled, and rebuilt. There are many other units and parts of the vehicle that do not require frequent rebuilding which can be overhauled economically at the same time. Extensive body work and paint jobs fit into this type of overhaul, with a maximum saving of manpower and a minimum period out of operating time for the vehicle. The design of the vehicle, the operating condition, and the quality of the A, B, C, and D maintenance services are the most important factors affecting the vehicle condition and the amount of work that will be required on the E maintenance service.

Cost of Eye Injuries

THE National Society for the Prevention of Blindness has announced the appointment of Robert S. Krueger as Director of Industrial Service. In making the announcement Dr. Franklin M. Foote, Executive Director of the Society, emphasized that each year in American industry approximately 300,000 eye injuries occur —most of them preventable.

"The annual bill for these accidents—in the cost of medical care, production lost, etc.—is upwards of $200,000,000 to say nothing of the loss in human suffering," Dr. Foote said.

"With the appointment of Mr. Krueger, the Society is expanding its program for the conservation of vision in industry."

Since 1945 Mr. Krueger has been connected with the American Optical Company, working on industrial vision control programs. Prior to that, as head of the safety department for Pratt & Whitney Aircraft Corporation, he established in 1943 a safety program for the company's seven plants, covering a total of more than 30,000 employees.

Mr. Krueger, a graduate of the University of Illinois, College of Engineering, has also been connected with leading insurance companies.

Mrs. Reece Dies

IT IS with deep regret that we call the attention of our readers to the death of Mrs. Alfa C. Reece, vice-president of the Reece Wooden Sole Shoe Company established by her husband, the late John A. Reece, 38 years ago. Mrs. Reece died at her home in Columbus, Nebraska last month after a period of declining health during the past few months.

In 1912 Mrs. Reece's husband bought the wooden sole shoe factory in Columbus that had been founded by A. C. Lutz in 1885, and with members of his family, formed the Reece Wooden Sole Shoe Company. Since his death on November 24, 1928, members of the family have continued operation of the factory which has become one of the largest of its kind in the United States.

Miss Dorothea Reece will continue as president of the company, with Mr. Gus Bergman as vice-president and Miss Genevieve Reece as secretary-treasurer.

Unusual Accidents

THIRTEEN unusual industrial accidents are the subject of decisions just issued by the Committee of Judges of the American Standards Association's project Z16. The decisions are interpretations of the American Standard Method of Compiling Industrial Injury Rates which provides the generally accepted rules for keeping track of the national industrial safety record. The standard was developed by cooperative action of 30 national organizations, members of an ASA sectional committee now working under the leadership of the National Safety Council and the Accident Prevention Department of the Association of Casualty and Surety Companies.

Individual companies use the standard for monthly compilations of their accident toll, and as a guide to unforeseen new hazards. Promptly reflected in the monthly record, these hazards can be eliminated without delay. In larger companies where the accident experience affects compensation insurance rates, such control may represent a substantial money saving.

Because differences of opinion frequently arise as to how an injury involving unusual circumstances should be counted in the records, a committee of judges interprets the standard in doubtful cases. The 13 new cases bring to a total of 54 the number of decisions now released to the public. All the published decisions are available from the American Standards Association, 70 East 45 Street, New York 17, N. Y. Safety engineers are invited to obtain rulings on doubtful cases by sending the facts to the American Standards Association.

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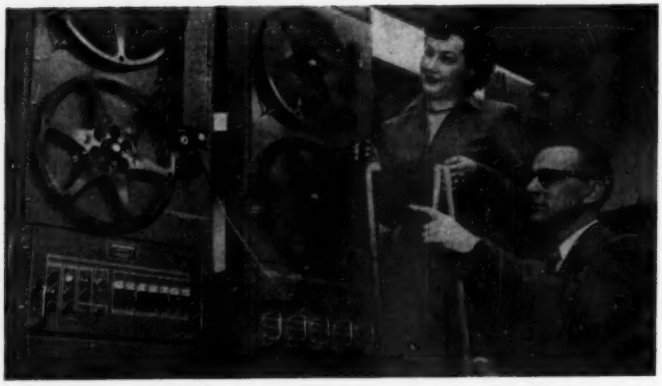
UNDERWRITERS LABORATORIES, INC., A. U. 1302
U. S. PAT. NOS. 2090197 & 2268697
KANSAS CITY 8, MISSOURI, U. S. A.

On page 69
You will find reviews of
FREE BULLETINS & CATALOGS

Pilot-to-Tower Recorder for Aviation Safety



Ingenious machine for aircraft communications records up to 28 voices on a single magnetic paper tape less than three-quarters of an inch wide. It makes possible a permanent record of all communications between pilots and control towers, thus permitting a detailed study of factors leading to air crashes.

SHOWN for the first time to aviation leaders from all parts of the country gathered for an Airways Communications Conference at Cleveland recently, was the much heralded multi-channel magnetic airport recorder. This unit, capable of recording fourteen channels simultaneously, makes possible for the first time in aviation history an exact record of all reports and communications between both pilots and control tower operators.

Confusion and contradictory testimony was disclosed in the investigation of the November 1, 1949, Washington, D. C. air disaster when a P-38 and an airliner collided in mid-air killing 55 passengers. This investigation substantiated the need for an actual record of every ship-to-tower speech transmission before and during a landing or take-off.

An exact recording of all reports and instructions communicated during an emergency obviously cannot prevent accidents. It can, however, be the first step in determining causes, in that it assures a thorough investigation that is not based on hear-say. It can thus help to prevent any recurrence.

The complete airport recorder is made to mount on three 7½-foot standard relay racks. The first rack includes two complete tape transport mechanisms, and the master recorder control panel. The second rack contains a third tape transport mechanism and the complete electronic set-up for the entire recorder. The third rack contains the play back and speaker unit. Parts are interchangeable.

Each reel of recording tape will run for slightly over four hours and will automatically start a second reel before the first is finished, thus giving up to eight hours of unattended operation. Automatic starting of a standby recording system and special alarm circuits assure that even a rare failure in the regular recording mechanism will not result in loss of a record of any communication.

On the basis of a minimum expected life of five years for the tape, the recording medium cost is only $\frac{3}{10}$ of a cent per hour per channel, assuming fourteen channels are recorded. Over a five-year period, the complete cost of this installation will be slightly over ½ cent per hour per channel.

Civil Aeronautics Commission has approved this system and at present it is being studied by both the Canadian and United States Air Forces.

Picture by courtesy of Brush Development Co.

Blatz Safety Record

EMPLOYEES of the Blatz Brewing Co. were cited twice recently for establishing a new safety record of more than a half a million man hours of operation completed without a lost time accident.

Acting in behalf of the company's entire personnel, representatives of the various departments, foremen, supervisors and company officials met in the Blatz guest auditorium tonight to receive a certificate of merit and a bronze plaque for the new record.

Beginning on November 2, Blatz workers in Milwaukee reached the half-million hour mark without a lost time accident late in January, according to Blatz president Frank C. Verbest. At that time, all Blatz employees, including sales and other representatives in field offices outside of Milwaukee, had compiled a total of more than 600,000 hours without mishap causing any worker to be away from his job. Verbest said he believed the mark was without precedent in the entire brewing industry. He based his statement on a report from the National Safety Council, which indicated the Blatz record had no parallel in the Council's files.

Paul DeMakes, a bottling plant employee who has been with Blatz for 23 years, was selected to represent his fellow workers in receiving the award from the company's industrial insurance underwriters.

Verbest pointed out that "safety records aren't just set for the purpose of establishing precedents."

"More than half a million man hours without a lost time accident

means that one, two, 10 or even a hundred people, by practicing the best rules of safety, have been spared untold pain, suffering and loss of income which might have resulted from a mishap," he declared.

"On top of that, the direct cost of accidents, in medical expenses, compensation, and the like, has been reduced materially."

Gregg R. Meyers, director of safety for Blatz, attributed the new mark to the elimination of physical and mechanical causes of accidents; proper safety training among foremen, and safe working habits developed and practiced by employees as a result of careful instruction by supervisory people.

Faceshields & Helmets

(From page 20) consists of an air-tight rubber mask covered with a chrome leather hood. Corrugated breathing tubes from the mask connect to the source of respirable air. The facepiece contains a combination frame and slip-front which contains the welding and cover lenses.

The most distinctive part of the new facepiece is the frame and slip-front assembly for holding the lenses. Three lenses are employed. One of them is a safety lens permanently sealed into the mask, providing an air-tight seal against the external atmosphere. The other two lenses, which are welding and pitting lenses, are inserted in the slip-front, and can be removed. The new unit offers a particularly wide angle of vision, in addition to furnishing the welder with complete eye, face and respiratory protection. The facepiece may be connected to a standard gas mask canister, an air line respirator assembly connecting to the plant's compressed air system, or hose mask assembly through which fresh outside air is fed.

This new development is of particular importance to the petroleum industry. Before development of the mask, it was necessary for a cleaning crew to spend several days preparing a tank for welding —not only to free it of explosive vapors, but to remove sludge, rust, scale, and dust. It was also considered good practice to operate a mechanical ventilator on top of the tank to exhaust fumes during welding. With the new mask, however, all that is needed prior to welding is to eliminate the explosion hazards in the tank and underlying soil.

Perhaps, the most noticeable point in this brief review of the "Faceshields and Helmets" subdivision of facial protection, is the wide variety of equipment available. The alert safety director will specifically define his problem and then choose the particular piece of equipment which meets the requirements of the job. Just "any type" of safety device is not sufficient. To properly protect the worker and enlist his cooperation in its use, equipment must be specifically tailored to the job at hand. You must cut the cloth to fit the pattern.

Pictures by courtesy of Mine Safety Appliances Company.

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Injuries Raise Construction Costs

ENOUGH construction workers to equal the population of Richmond, Virginia—193,000—lost time because of injuries experienced in the course of their work during 1948, according to final estimates of the U. S. Department of Labor's Bureau of Labor Statistics. These injuries resulted in 2.7 million man-days of lost time during the year—equivalent to a wage loss of over $26 million, only part of which was covered by workmen's compensation payments.

Future losses arising from these same injuries will increase the cost by 23 million more man-days—$228 million at present wage values. When employers' losses in terms of medical costs, property damage, and other indirect costs are added, the total reaches $770 million.

The more serious injuries included 2,100 killed, 300 totally disabled for the rest of their lives, and 7,800 permanently impaired. The other 182,800 each lost at least 1 full day of work because of his injury.

In the general contracting field, the highest ratio of injuries occurred in highway and street construction. This group had an injury-frequency rate of 43.3 disabling injuries per million employee-hours worked. Rates for the other types of general contracting, however, were only slightly lower—39.2 for heavy and marine construction, and 39.0 for building construction.

In the special-trades group, the highest incidence of injuries occurred in wrecking and demolition work, which had an injury-frequency rate of 58.3. Other special trades with particularly high injury rates included: Structural steel work, 52.4; ornamental-iron and steel work, 49.4; installation of machinery and equipment, 46.7; and roofing and sheet metal work, 40.0. The lowest injury rates in the special-trades group were: 15.9 for parquet and hardwood floor work; 19.2 for painting, paper hanging, and decorating; 19.4 for terrazzo, tile, marble, and mosaic work; and 20.0 for general building maintenance work.

The highest ratio of fatalities, 1.8 for every million employee-hours worked, occurred in the house-moving operations. High fatality rates were also recorded for structural-steel work, 1.2; and for general building maintenance, 1.1. High rates for permanent impairments were found in: Installation of machinery and equipment, 8.7 cases per million employee-hours worked; structural-steel work, 4.5; and ornamental-iron and steel work, 3.4. The lowest rates for fatalities and permanent impairments combined, occurred in glass and glazing work, masonry and stone work, insulation work, concrete work, and parquet and hardwood-flooring work.

Static-Conducting Belts

A RECENT bulletin of The B. F. Goodrich Company on static conducting belts contains the following:

Static electricity is caused by the friction of two unlike materials rubbing together. Rubber, leather, canvas and all other types of belting will generate static charges under normal operating conditions unless some provisions are made to eliminate the static charge build-up. Generally this static charge bleeds off the media through the air, and no sparking occurs. However, in some cases, especially with low humidity conditions, very high voltages are built up on the belt. The potential of the static charge is dependent on the composition of the belt, the speed of the belt, the sheave sizes, the belt cross sectional dimensions, the amount of slippage present, etc.

If a standard belt of high resistivity is used on a drive and a charge is built up, there are several ways of removing the charge. One

method is point contacts on the belt where it enters and leaves the pulleys; another is wire combs contacting the belt surface; and in some instances a conductive paint is applied to the belt. However, these methods are not too satisfactory and the sure way of determining that adequate protection is provided is to use static conducting belts.

These belts should be checked 100% for static properties before shipment is made. This is done by means of a 500 volt Megger unit, tied into two contact poles, each having a diameter of 5/8" and being 8½" apart. The pressure applied is three pounds per square inch. The contact poles are moistened and then the belt is placed directly under the poles in order to obtain the resistance reading.

It is felt that a belt which measures 10 megohms resistance when checked on an 8½" section will have sufficient static properties to make the belt safe throughout its entire life. To the average person 10 megohms (10,000,000 OHMS) seems like a very high amount; however, the difference in conductivity between conductors and insulators for static charges should not be confused with the characteristics of similar materials when used with the common electric current. It should be remembered that the conductivity needed to dissipate a static charge is minute, and that insulators for normal electric current actually may act as conductors for static charges.

An industrial fire insurance company makes the following statement:

> "We have concluded that a belt having a resistance of 75 megohms or less, when tested across four inches of its surface by using two polished copper electrodes connected to terminals of a 500 volt Megger meter, will not generate static provided the belt is driven from a grounded metal pulley to a grounded metal pulley."

We have found that the more the compound is "loaded" to afford better conducting qualities, the more the belt life is decreased. One of the reasons B. F. Goodrich set their standards at 10 megohms was to enable the consumer to obtain usual belt life. Also, if a belt is too conductive it may allow a slight flow of normal electric current and if there was a "short" in the system a dangerous condition would exist.

By far the most important thing to remember when discussing static belts, is the fact that if the motor and driven unit are not adequately grounded no matter what static belt is used there will be no protection against sparking.

Dirt, oil, water, etc., will change the characteristics of the belts so the drive should be fully protected. Only in this way can they be assured that the belts will retain their original properties.

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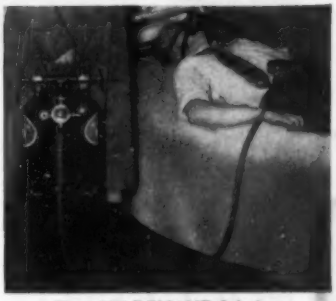

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The Right Light for Safety & Production

THE improvement of lighting conditions in an industrial plant results in increased production which can effect a return of several hundred per cent per year on the additional investment, according to Carl E. Egeler, illuminating engineer of General Electric's Lamp Department.

Speaking before members of the American Society of Mechanical Engineers and the Society for the Advancement of Management at their first annual Plant Maintenance Show in Cleveland recently, Egeler said skilled workers' production invariably improves when adequate illumination of good quality is provided.

One company reported a 25 per cent increase in punch press production when special, local or general lighting was installed, he said. To illustrate his point further, Egeler pointed out that a textile mill increased production 9 per cent and reduced mending cost 33 per cent, and that a machine tool manufacturer reported a 15 per cent production increase in the first department lighted as part of a relighting and finishing program.

A good lighting system should provide an adequate amount of light for the seeing task being performed, a minimum of direct and reflected glare, and, for most comfortable seeing, background brightness comparable to those of the task and its immediate surroundings, Egeler said.

The amount of light provided at the work area should be determined by analyses of the seeing tasks involved. He said minimum footcandles desired might range from 5 footcandles for "rough seeing tasks" in hallways and corridors, to 100 or more footcandles for the finest precision work.

The color of light to be used for industrial operations also needs close attention. The color of light emitted by the "standard cool white" fluorescent lamps finds the widest application. Under these lamps the appearance of most industrial materials is excellent, he said. Where color discrimination is an important part of the seeing task, however, the new "de luxe cool white" fluorescent lamps "give fine color balance over the entire spectrum."

Color conditioning of industrial interiors is to be treated not so much as a matter of decoration, but rather as an element in the production process, Egeler declared. As an example of approved painting color combinations, he said General Electric's own first choice is a blue-green to provide cheerful and colorful backgrounds. Another preference is light buff, sometimes with a brownish tint. The hues are graded downward from the white ceiling, so that the brightness of the surfaces also steps down.

"Color and good lighting are partners in producing seeing conditions which stimulate high industrial production," Egeler declared, "and as such are an accepted feature of plant design and operation." He saw the combination as having an important bearing on employees' health and morale, on simplifying the maintenance problem, on accident reduction, and on improvement in the quality as well as quantity of production.

Willson Products in Detroit

WILLSON Products, Inc., Reading, Pa., announces the appointment of the Charles A. Strelinger Company, Detroit, Michigan, as its distributor in that area to handle its industrial safety equipment line of goggles, respirators, gas masks, and welding helmets. The new distributor has just opened a Safety Division which will be managed by C. W. Peterson, formerly District Sales Manager of Willson's Detroit office, which has now been closed.

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For full information write Mr. W. C. Sprong, Saf-Test Dept., Knapp Brothers Shoe Mfg. Corp., Brockton 61, Massachusetts

Patten Honored

WILLIAM N. PATTEN of Salem, was honored at a dinner given by his old associates in Stone & Webster Engineering Corporation in recognition of the 50th anniversary of his joining Stone & Webster.

Mr. J. R. Lotz, chairman of the board, presented on behalf of the General Safety Committee the William N. Patten Trophy, a specially designed bronze plaque, which will perpetuate Mr. Patten's name in the Stone & Webster organization for his leadership in accident prevention work and his important contributions to its construction activities.

The trophy established in Mr. Patten's name will be kept permanently at the offices of the corporation, annual awards being made and inscribed on it for the Stone & Webster construction project having an outstanding safety record for the year.

Mr. Patten joined Stone & Webster shortly after graduating from the University of Maine with the class of 1891 and has served successively as draftsman, chief draftsman, engineer, and construction manager. In 1928, he was elected vice president and director of the corporation. For some years prior to that time, recognizing construction as one of the more hazardous major industries, he intensified the safety activities; the success of his work has been demonstrated by a marked reduction year by year in the frequency and severity of disability accidents.

Research Grant to Center for Safety Education

THE American Museum of Safety has announced the Arthur Williams Fellowship grant of $1,500 to the New York University Center for Safety Education to undertake research studies on the development of industrial safety training programs for industries and for colleges. According to Wallace Falvey, President of the Museum, this grant became effective on February 1, 1950, and will extend through the year.

This is the fourth such grant that has been made by the Museum to the Center. The first was in 1945, when John V. Grimaldi carried on research and prepared the publication *Industrial Rehabilitation;* a second was utilized in 1946 for the development of curriculum materials for the New York City Schools; and a third in 1947 to endow a study and publication on safety in air transportation. The latter has not yet been published.

According to Dr. Herbert J. Stack, Director of the Center for Safety Education, Dr. Walter A. Cutter will serve as director of the proposed study. Invitations to serve on an advisory committee for the study will be extended to organizations interested in industrial safety training: engineering colleges, The American Society of Safety Engineers, the National Safety Council,

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the Greater New York Safety Council, the Engineering Committee of the Association of Casualty and Surety Companies, the Veterans of Safety, the President's Industrial Safety Conference, the National Commission on Safety Education, the Safety Director's Office, Department of the Army, the Ground Safety Office, Department of the Air Force, and the U. S. Department of Labor.

FLAMING METAL

(From page 29) when exposed to a fire is a vital consideration. Iron or steel columns without fire protection will give no more than about 20 minutes resistance to intense fire. A stream hitting the column might cause it to fail sooner.

In fire tests the ultimate strength of structural steel rose from 43,000 pounds per square inch (in compression) at room temperature to a maximum of 53,000 pounds per square inch at about 370 degrees F. After that it dropped sharply to about 23,000 pounds per square inch at 1,000 degrees F. and about 4,500 pounds per square inch at 1,500 degrees F. Considering that a fire can reach a temperature of 1,000 F. in 5 minutes and 1,550 degrees F. in one-half hour, it is not difficult to see how unprotected columns would fail. After one fire an 8x10-inch timber was not greatly affected, but an unprotected 10-inch steel beam on each side of it was warped and twisted.

The high manufacturing cost of steel alloys that can withstand heat makes their use for structural sections prohibitive. Instead, the iron and steel structural members are brought up to the desired fire resistance standards by protecting them with noncombustible materials such as concrete, brick, hollow tile and gypsum vermiculite plaster.

Heat Treating of Metals

Unless properly supervised, the use of molten baths in the heat treatment of metals can be extremely dangerous. The low-temperature neutral baths, utilizing a combination of nitrate and nitrate salts, present the greatest hazard because their oxidizing powers are highly active in the molten state. If overheated to above 1,100 degrees F., the nitrates will attack the mild steel metal containers. It may cause failure and spillage of the molten salt. At 1,300 degrees F. the salts tend to break down and emit toxic fumes.

Aluminum alloys are treated in these low temperature baths. Unless the percentage of alloying magnesium is small and the temperature is maintained below 1,000 degrees F., the metal may react explosively with the bath. In the heating section of a western plant an aluminum alloy was being processed in an equal mixture of potassium nitrate and sodium nitrate. A night watchman, noting a pyrometer reading of 1,080 degrees F., tried to reduce the supply of gas heating the bath. After several hours the bath was still too hot and it foamed over. The reaction of the hot salts and the metal being treated caused an explosion of such intensity that a 650-pound steel section was sent crashing through the plant to land 1,000 feet from its original position.

Water, entrapped air and carbonaceous materials in contact with the salt baths have also taken their toll in destructive fires and explosions. Plants using nitrate baths should have a sufficient supply of dry clean sand available for diking to confine the spread of any running metal. Carbon dioxide and dry powder extinguishers are effective in any fire caused by the salt. Carbon tetrachloride, water or any water-base extinguishing agents should be avoided.

Magnesium Hazards

Magnesium, we know, burns furiously. In the form of the World War II incendiary bomb it was necessary to light a charge of thermit before the magnesium itself ignited. Once burning, however, the flaming metal proved to be one

of the most destructive devices used against England.

The susceptibility of magnesium to fire depends to a great extent upon its physical characteristics. Large objects are not easily ignited. They must be subjected to a high temperature for a long period of time before combustion begins. Smaller particles like turnings, shavings and particularly dusts are easily set afire.

The temperature at which magnesium ignites is also dependent upon whether the metal is pure or alloyed. In a pure state it melts and begins to burn at about 1,200 degrees F. Certain of its alloys ignite at approximately 800 degrees F., when that temperature is maintained for some time.

The industrial use of magnesium presents unique hazards because it will combine readily with oxygen, will burn in carbon dioxide and will even unite with nitrogen to form magnesium nitride.

Foundries handling molten magnesium employ sulphur dioxide to prevent oxidation and ignition while processing it. The gas does not act as an extinguishing medium but merely forms a protective layer over the molten mass.

G-1 powder, mainly graphite, is the most commonly used extinguishing agent and is listed by the Underwriters' Laboratories and the Factory Mutual Laboratories. Water is permissible but one must be certain that the resulting reaction can be easily controlled and that the water supply is large enough to cool the metal below its ignition temperature. Carbon tetrachloride must not be applied to flaming magnesium because it reacts explosively with the burning metal. Helium and argon will not react with magnesium, and, while it is possible to use them as extinguishing agents, their expense and poor cooling qualities rule against them.

In machining magnesium, the following precautions are recommended by the American Society for Metals:

1. Do not allow chips or dust to accumulate on machine or clothing.
2. Store chips in covered metal containers.
3. Keep a container of a recommended extinguishing agent at each machine.
4. Keep tools sharp.
5. Back tools away when not in use.
6. Use cooling liquids where indicated.
7. Avoid generation of sparks.
8. Use dust-exhausting equipment that precipitates grindings in water.
9. Wear smooth easily removable apron when grinding.
10. Do not grind steel or other metals on wheels used for magnesium.
11. Store grindings under several inches of water before a disposal.

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of 1,210 degrees F. is similar to magnesium in many respects but presents less of a fire problem. Of course the use of finely divided aluminum in the form of flaked powder, sometimes called aluminum bronze powder, and aluminum powder in paint pigments is hazardous from the dust explosion standpoint.

During World War II aluminum was used on a large scale and subsequently has been put to use for many purposes where other metals formerly did the job. Where it replaces iron and steel, its fire resistant properties must be carefully considered. Aluminum structural members are utilized in some instances where weight is an important factor. The hazards of unprotected structural steel members are present in an even more marked degree with aluminum.

One aluminum alloy, manufactured as a structural member by a leading aluminum factory, has a tensile strength of 45,000 pounds per square inch at room temperature. At 600 degrees F., a temperature that a fire might produce in about 3 minutes, the tensile strength drops to approximately 3,500 pounds per square inch. Even the fire protective standards designed for structural steel will not necessarily be safe for aluminum. Depending upon the particular conditions, the thickness of the specified fireproofing would have to be increased accordingly for the aluminum.

Because of the low melting point of aluminum, a series of airplane fires were caused by substituting it for copper (melting point 1,981 degrees F.) Thin-walled aluminum alloy hydraulic lines were used to carry flammable liquids under pressure in the planes. When a short circuit flashed arcs to the tubes, the aluminum melted at the hot spot and the released fluids ignited.

Every material has its characteristic properties when exposed to heat, chemical action and fire. The behavior of metals in all their physical forms is one more study that must be added to the ever increasing store of knowledge necessary for the safety engineer if he is to prevent accidents and insure the continuity of production with maximum efficiency.

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Pictures by courtesy of New York Fire Dept. Top left by Hellreigel.

California Conference

THE elimination of 33,000 disabling injuries at a cost of 55 million dollars is one of the immediate objectives of the forthcoming Governor's Industrial Safety Conference, states Paul Scharrenberg, State Director of Industrial Relations, who is Chairman of the Conference.

For the past five months, leaders in every field of industrial life and in every center in the State have been meeting to study the accident problem and to present plans for its reduction to the Conference on April 12 and 13 in Los Angeles.

Last year 128,520 California workers met with disabling injuries, with an over-all cost estimated at more than 220 million dollars. The Conference, through a campaign of intensive accident prevention, will try to cut this unnecessary toll by at least 25 percent.

Safety Committees have been set up within each industry, with subcommittees in various areas. Thus it is anticipated that every California plant, large and small, will be covered by one or more of the accident-prevention groups.

Butch Learns to Lift

"LEARN to lift? . . . Nobody has to learn that!" the new hand at the plant told his foreman, in the Bureau of Labor Standards' most recent publication—"Butch Learns to Lift."

But before many workdays had passed, Butch was recovering from a strained back and calling for help. He found that there were "tricks to the trade" after all, and was soon convinced that different methods had to be used in handling various sizes, weights, and types of objects. Butch learned how to lift with his leg muscles and save his back from strain and himself from undue fatigue. He also learned about such things as team lifting and when to call for the lift truck.

A safety guide for workers in all types of industrial plants, this 16-page pocket-size pamphlet discusses the basic essentials of safe lifting, including eight specific pointers on safe lifting practices. Popularly written and amusingly illustrated, this booklet is the fourth in a new series of safety pamphlets designed for industrial workers and supervisors.

A limited supply of free copies may be obtained from the Bureau of Labor Standards, U. S. Department of Labor, Washington 25, D. C. Quantities may be purchased at 10 cents each or $5 per 100 from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Remittance should accompany all purchase orders and be sent directly to the Superintendent of Documents.

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. . . Gardwell Underwriters Grade Asbestos Gloves.

Where heat and flame are the chief hazards asbestos clothing, gloves and mittens are supreme. GARDWELL asbestos clothing includes everything from a complete suit with helmet, gloves, coverall, etc.

. . . Gardwell Underwriters Grade Leather.

For rough service in protection from sand, steel shot, electric welding, etc. you can't beat GARDWELL leather leggings, welding jackets, sleeves, clothing, etc. The GARDWELL "FRANK" Knee Legging illustrated is a favorite in thousands of plants all over the country.

No. 500

. . . Gardwell Underwriters Grade Asbestos Mittens.

This special pair type mitten is 14" long. High grade chrome leather reinforcement on the palm and thumb extends about an inch onto the back thus reinforcing all seams. The reinforcement on the thumb also covers the back to protect the thumb seams. Has woolen lining, made large for quick removal.

No. 116

Also items from GARDWELL Ply-Garb, Oil-Chem, Canvas, Fireproofed Duck and Rubber—all made from highest quality materials, by expert workmen and backed by over 25 years experience. Send for Catalog,

Safety CLOTHING AND EQUIPMENT Co.
7016 EUCLID AVENUE · CLEVELAND 3, OHIO
PHONE ENDICOTT 1-1722

Floor Maintenance

(From page 22) need sealing to keep them from dusting and also to render them impervious to stains and the deleterious effects of acids and alkalies. Here the type of sealer will be governed by the use to which the floor is put. As an example, dairies require a seal to protect the floor from butter fats and lactic acids. On the other hand, a cotton mill has a problem which requires a different type of sealer. The varnish type or resinous seal isn't the answer to all problems any more than is the chlorinated type. The sealer-type should be checked with the manufacturer before application.

Terrazzo, by ageing and regular use of a good vegetable oil soap, will develop a beautiful soft lustrous patina. It is particularly true of Magnesite that the efflorescence or bloom must work out. However, it is not necesary to have bloom if the mixture can be perfectly balanced. But differences in water, plus changes in humidity, make it almost impossible to have a laboratory-controlled mixture on the job. This, however, does not detract

(Continued on next page)

10 TIMES HIGHER ABRASION RESISTANCE . . .
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MUCH HIGHER CHEMICAL RESISTANCE . . .
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THE SURETY RUBBER CO. CARROLLTON, OHIO

Ask for Surety's unique Glove Selector, the quick guide to the right glove material for your operations. Dept. E

(Continued from page 43)

from the desirable features of the flooring.

Although one should always neutralize the free alkali in cement floors, never apply acids to other types of vitreous floors. One exception to this is where the glaze has been worn off of Ceramic tile and dirt has become embedded in the pores. An ideal way to clean these floors prior to sealing (to replace glazed surface) is to scrub with a long handle scrub brush using a solution of one pound of ammonium-bifluoride to three gallons of water. Be careful of the operator's eyes, however.

Care of Resilient Floors

In the wide variety of resilient floor coverings, we find many color combinations. To keep these floors new-looking and resilient, use only a good neutral cleaner. The use of harsh cleaners will cause hardening or bleeding of color. Never use very hot water or over-flood the floor.

Currently some floorings will bleed color with just plain water. This should eventually disappear when the excess pigment is gone.

From a safety standpoint, there are dressings which have been approved by the Underwriters' Laboratories. From a standpoint of a good dressing for your floor, look for and demand clarity of film, ease of application, water resistance, high co-efficient of friction and easy removability.

There is no magic in eliminating dirt and soil. It entails cleaning and with that goes physical effort. The only thing resembling magic is the chemist's beakers and test tubes which have given us improved materials with which to work. Products and techniques have come a long way from yesterday's offerings, but the basic function of cleaning a dirty floor and re-dressing it still remains. Even though there is no magic formula, floors can be maintained *better and with less drudgery* by careful planning, modern methods and suitable materials.

Injuries Down in '49

WORK injuries in the United States decreased more than 7 percent between 1948 and 1949 according to preliminary estimates of the U. S. Department of Labor's Bureau of Labor Statistics. A slightly lower level of employment and decreased hours of work account for part of this reduction, but the major portion of the gain resulted from improved safety conditions in many industries.

The 1949 volume of disabling work injuries was estimated at 1,870,000, a reduction of about 150,000 from the final estimate for 1948. This represents the lowest volume of injuries since 1939.

Fatalities decreased by over 6 percent from 16,000 to 15,000. Permanent-total disabilities dropped from 1800 to 1600. The volume of permanent-partial disabilities was down 8 percent from 86,700 to 79,400, and the number of temporary-total disabilities dropped 7 percent from 1,915,400 to 1,774,000. The latter group accounted for 94 percent of all the injuries.

Temporary-total disabilities are those which result in inability to work for at least one full shift after the day of injury, but involve no permanent ill effects. Permanent-partial disabilities involve loss of some member of the body or the impairment of the use of some body part or function which will disable the workers to some extent for the remainder of their lives.

Actual time lost during the year because of work injuries which occurred in 1949 is estimated at about 39,000,000 man-days, the equivalent of a year's full-time employment of approximately 130,000 workers. If additional allowance is made for the future effects of the deaths and permanent physical impairments, the economic time loss would amount to about 204,000,000 man-days. This is equivalent to a year's employment of about 680,000 workers.

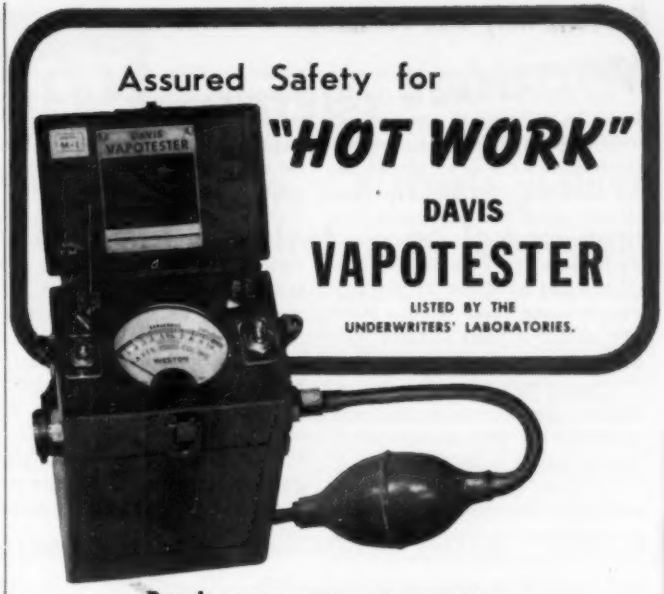
The greatest reductions in injury volume occurred in the railroad,

mining, and manufacturing industries. In each of these industry groups there was some decline in employment and in hours worked, but the drop in injuries was greater than could be accounted for by these factors.

Employment on railroads decreased about 18 percent in 1949, but work injuries were reduced nearly 27 percent. Employment in mining declined slightly, but reduced operations resulted in a sharp drop in total hours worked. The 20 percent drop in injuries, however, exceeded the decline in hours. In manufacturing, injury rates fell sharply during 1949. Coupled with a slight decline in employment, this produced a 19 percent drop in injuries.

Despite a continued high level of operations, construction injuries declined more than 5 percent in 1949. Similar drops in injury volume occurred in retail and wholesale trade and in the miscellaneous transportation industries. In the public utility group injuries were down about 1 percent.

The only industry group showing an increase in injuries during 1949 was that made up of the service, government, and miscellaneous industries. In this group there were about 2 percent more injuries than in 1948. Most of this increase occurred in the governmental segment of the group.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Fire Hazards of New Bleaching Process

A NEWLY developed bleaching process which is being used by flour manufacturers and fat rendering companies and may be used by the soap industry, sugar refiners, and many other industries, has introduced new fire and explosion hazards which are discussed in a report issued by the Research Division of the National Board of Fire Underwriters.

The report is titled "Precautionary Fire and Explosion Safeguards in the Use of Chlorine Dioxide for Industrial Bleaching." It offers detailed recommendations for the use of chlorine dioxide, which is spontaneously explosive in concentrations over ten per cent, and for safe handling and storage of sodium chlorite.

The report covers the theory of operation of the new bleaching process, design and construction of the equipment used, and safe installation and operation of typical units.

"These installations are presently found in a number of establishments where little or no previous experience has been had with chemical operations and critical process control," the report states. "Education of the operating personnel on the potential fire and explosion hazards is essential and should be made mandatory."

Research Report No. 7 is available without charge from the National Board of Fire Underwriters, 85 John Street, New York 7, New York.

Handle Safety Like Production—Warns Heinrich

THE number of workmen who are killed or injured on the job could be reduced if management were to get its foremen and supervisors to use the same procedures for accident prevention as they are already using for production performance, the annual convention of the Greater New York Safety Council was told on March 29. The suggestion came from H. W. Heinrich, author of texts on safey engineering.

"One of the newer and more effective approaches to accident prevention," Mr. Heinrich told a convention session in the Hotel Statler, "is that of providing direct assistance to the industrial supervisor by means of safety-production analogy. Granting that supervisors not only know but actually do control employee production performance, we need only to show that for the control of both production faults and accident occurrence (1) the causes are alike, and (2) the remedies are the same, and (3) the same supervisor is in charge of the same employees, therefore he has identical responsibilities and opportunities."

Citing several cases where foremen were found to have trained their men to 100 per cent observance of production rules and techniques, but failed to secure their cooperation in wearing goggles for hazardous operations and in other important safety measures, Mr. Heinrich said there was an improvement in observance of safety regulations as soon as the foremen were made to realize that this was as much their responsibility as was production.

"Management and safety engineers," Mr. Heinrich said, "are urged to make more frequent and effective use of the analogy, this 'teaming up with the supervisor' for the benefit of industry and humanity."

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ELECTRO-LOCK SAFETY SHIELD

Another Junkin device that actually ENFORCES safety, because grinder can't operate until shield is in position. Write today for our new booklet which gives full details of this latest protection against the dangers of grinder operation.

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Effects of Color

SCIENCE and industry have trained their sights on solving the problem of one of nature's oldest, most common, and yet most mysterious phenomenon—the secret of color. Seeking the answer to this age-old puzzle is a special long range project set up August 1, 1948 by the Institute for Cooperative Research of The Johns Hopkins University and sponsored by the Paint Department of the Pittsburgh Plate Glass Company.

According to Dr. W. R. Garner, Director of the Institute's Psychological Laboratory, the research and development work in the field of color will include "the investigation of psychological and physiological reactions of human beings to color in industrial establishments, offices, hospitals, schools and homes."

Sponsor of the project, the Pittsburgh Plate Glass Company, has been a leader in the scientific use of color. In developing a special system of painting known as Color Dynamics, it has found the use of certain colors and combinations have produced highly beneficial results.

Color Does Affect Us

Speaking of this, E. D. Peck, Pittsburgh's General Paint Manager said, "Color is so very necessary and so very fundamental that the broadest use of color has somewhat surpassed our understanding of its optimum effect."

"While it is true," he continued, "that we know from actual field tests and experience, starting in 1940, that certain hues, values and chromas of colors influence mental attitudes and create physical reactions, we do not know precisely why and to what specific degree. We seek refinement and expansion of existing knowledge through fundamental research of the highest order."

Catch 'em Young

(From page 17) an increasing observance of shop safety regulations.

Setting Up the Program

The safety goggle program was sponsored by the Board of Education upon recommendation of Dr. John L. Hopkins, Superintendent of Schools. Superintendent Hopkins was impressed by the wonderful results in reduction of eye injuries being obtained by many industries which require wearing of safety goggles in their shops. He had special opportunity to observe procedures adopted by the American Car and Foundry Company. One of the Hastings Board of Education members, Spencer B. Hopping, is associated with that company in the Safety Division.

During the summer of 1949, the Board of Education purchased safety goggles for each shop student. In September, the president of the goggle company personally gave instructions to the school nurse

STOP INDUSTRIAL DERMATITIS!

Now... a simple positive control... at lower cost

DID YOU KNOW that skin infection is the cause of 65% of all industrial health ailments? Medical research has recently revealed this amazing fact, and has proved that most of this infection results from bacteria *on the skin*. You can check this cause of industrial absenteeism quickly and economically by using Powdered Germa-Medica with Hexachlorophene (G-11). This powerful new hand soap *stops much skin infection and many communicable diseases at the source* by drastically reducing the germ-causing bacteria on the skin. Try it. Protect the health of your workers and realize important new savings through reduced absenteeism.

NEW MEDICATED POWDERED SOAP

Powdered Germa-Medica is used like any ordinary powdered soap, yet it gets the germs as well as the dirt. Economical—write for free sample.

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WITH HEXACHLOROPHENE (G-11)

for fitting the goggles. He was assisted by the shop instructors. The goggles are really bow-glasses, similar in weight and appearance to regular glasses. Prescription glasses were paid for by the Board. Protective temple guards may be slipped on the bows if necessary. Special cabinets were built and erected at the entrance to the shops, so that students may obtain glasses immediately upon entrance.

The Wise Owl Club is an interesting feature of the safety goggle program. After the safety goggles were introduced this year, Dr. Franklin M. Foote, Director of the National Safety for Prevention of Blindness, 1790 Broadway, New York, New York, appeared at a high school assembly and presented a charter to the high school for membership in the Wise Owl Club. According to Dr. Foote, Hastings High School is the first in the United States to adopt a one hundred percent safety goggle program. To become a "Wise Owl," a student or industrial employee must offer evidence of a damaged pair of goggles and other corroboration that the wearing of safety goggles prevented serious eye injury.

The General Safety Program

The goggle program is a part of an over-all safety program which Superintendent Hopkins has developed in the entire school system. Auto-driver education is another feature of safety education. The objectives of the entire program are to develop desirable attitudes toward safe living, to develop and strengthen safety habits, to develop skills in the avoidance of accidents, and to acquaint pupils with possible hazards of everyday living and the consequences of carelessness.

Safety units of instruction are included in the following courses: health and physical education, general science, industrial arts, home economics, English and social studies. Safety in the home is stressed in home economics and industrial arts.

The eye safety campaign in the school shops is just part of the over-all emphasis upon accident prevention. For example, anti-skid walkway surfaces have been placed in front of all machines such as circular saws, jointer and band saws. The elimination of hazardous matting facing machines reduced the tripping danger usually associated with unsafe floor covering. Moreover, aisle markings of high visibility yellow (safety color code) are used throughout the shop.

Tool safety is stressed by periodic inspection by the instructor. If necessary, tools and faulty equipment are discarded or reconditioned. Mechanical safety is in-

ALL YOURS
for the asking!
See page 69 for the Free Bulletins & Catalogs

creased through periodic inspection by an official of the State Department of Labor, Safety Division.

Fire prevention is emphasized by insistence upon the proper storage of combustibles, acids, waste, oils, grease, etc. Personal hygiene embraces guidance in frequent and proper care of the skin, ventilation, and first aid.

Safety posters are placed strategically throughout the shop and are brought specifically to the attention of the class.

In the opinion of the instructors, students who enter industry after graduation from the High School have an adequate background in safety education and training and are well on their way toward complete orientation in the manifold benefits of accident prevention effort.

New NBFU Engineer

APPOINTMENT of John A. Neale as chief engineer of the National Board of Fire Underwriters has been announced in New York by W. E. Mallalieu, general manager. Mr. Neale has been vice president and chief engineer of Underwriters Laboratories Inc., of Chicago.

Mr. Neale is a graduate of Tufts College Engineering School, with a degree of Bachelor of Science in Civil Engineering. After leaving college, he worked for the Associated Factory Mutual Fire Insurance Companies as an inspector, served in the U. S. Army during World War I as a lieutenant of artillery, and joined the Tennessee Inspection Bureau.

He became chief engineer of the Chicago Board of Underwriters in 1924 and joined Underwriters Laboratories Inc., Chicago, as Protection Engineer in charge of department testing and listing of building materials in 1938. Later, he became chief engineer in charge of the burglary protection, casualty and automotive, chemical, hydraulic, building materials, combustion equipment, gases and oils departments. Mr. Neale is a member of numerous engineering and fire prevention societies.

The engineering staff of the National Board of Fire Underwriters has made surveys of more than 470 American cities over 25,000 population. These surveys, with recommendations for improving water supplies, fire departments and building conditions, are made periodically as a public service of the capital stock fire insurance companies. The staff of the National Board also develops standards for safe handling of dangerous and flammable materials, and the fire protection of industry, and publishes bulletins for fire departments.

Mr. Neale, who reported for duty on March 1, succeeds the late Calvin G. Lauber, acting chief engineer, who died suddenly on January 4. Mr. Lauber succeeded George A. Booth, who retired on December 31, 1949 after serving 39 years as head of National Board's engineering staff.

HORSE SENSE *about* ATHLETE'S FOOT

Bathers like to step on the Onox sponge-rubber mat.

Over 70% of the largest manufacturers in the United States are using Onox in their shower rooms.

Why? Just plain horse sense.

The main cause of athlete's foot is shoe-softened skin (*U. S. Public Health Service Bulletin R-674*). And Onox mineral salts toughen the shoe-softened skin and restore its natural resistance to fungus growth.

For full information about Onox and 60-day trial offer, write:

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ORIGINATORS OF SKIN-TOUGHENING METHOD OF ATHLETE'S FOOT PREVENTION

Cash Award for Safety

AN IMPORTANT phase of the 1950 industrial relations program now being conducted by the Otis Elevator Company is a year-long industrial safety contest featuring cash prizes and the awarding of plaques and certificates of commendation to employees in the company's three manufacturing plants and in its ten zone offices throughout the country.

The safety campaign, which was initiated on January 1, is being staged under the direction of L. W. Whitton, Vice President in Charge of Production; J. H. Holzbog, Director of Industrial Relations; and W. J. Niederauer, Safety Director.

"The underlying purpose of this safety competition for both plant and zone personnel is to further stimulate interest among all Otis employees in the reduction of industrial accidents. At the same time we aim to provide a continuing incentive to employees to make greater use of available safety equipment and to follow safe practices in doing their jobs," Mr. Whitton said in announcing details of the contest.

L. A. Petersen, President of the Otis Company, will present Presidential Plaques to winning plants and zone Construction and Service Departments on the basis of the lowest accident rate for the year and for the greatest percentage of improvement shown in accident rate this year in comparison with 1949.

All foremen in the plant that compile the lowest accident frequency rate and who have operated their departments for the year with an industrial frequency rate of 20 accidents, or less, per million man hours worked, will receive an award of $25. The assistant foremen in these departments will receive a $15 award.

Plant foremen of every department having a perfect lost-time accident record for the year will receive $50 and a certificate of

commendation. Assistant foremen will receive $25, and each hourly paid employee in the department will be given $10, or an equivalent gift.

Plant managers T. S. Jones of Yonkers, N. Y., and J. F. McEvoy of Harrison, New Jersey, will make special awards to winners of intra-plant division competitions.

General foreman of the division with the lowest yearly accident rate will receive $100 and a certificate of commendation. The assistant general foreman will receive $50. The same awards will be given to the general foreman and assistant foreman in the division showing the greatest percentage of improvement in accident rate.

In the zone competition, supervisors of construction and service departments that compile the lowest industrial injury frequency rates for the year will receive a $50 prize. Supervisors in departments with the highest percentage improvement in industrial injury frequency rate will also receive $50. Hourly paid employees in the department that attains the greatest percentage improvement in injury frequency rate will receive $10, or an equivalent gift.

The Safety Department will issue monthly reports showing the accident rate and standing of each competing group in the plant and zone competition. Only on-the-job accidents that cause actual loss of time from work will determine accident rate standings. All accident rates and percentages will be computed in accordance with the definitions and methods outlined by the American Standards Association. Duplicate awards will be made in the event of ties.

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STAY FRESH
wear a
DUPOR No. 1
miniature NOSE MASK for
Dust, Fumes, Paint Spray
Has 9 sq. in. filter. Mask is of soft rubber equipped with nose wire that's adjustable to any shape nose. Exhalation valve exhausts breathed air and keeps out unfiltered air. Handy as a pair of glasses. Complete panorama vision, no blind spots. Does not interfere with talking, eating, smoking. Fits the vest pocket. Weighs 1 oz.
Sample sent $1.00 pp
For the best in eye protection get H. S. Cover's Gas-Tight, Fog-Proof Goggles..$1.65 pp.
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Safety Discussed in New Woodworking Book

ALTHOUGH designed principally for the home hobbyist and carpenter, a new book entitled "Woodworking for Everybody" has much to recommend it for industrial woodworkers as well. In addition to telling how to cut and shape wood and how to make things, it devotes considerable space to the safe use of tools and to safety in woodworking. Written by J. G. Shea and P. N. Wenger, this 192-page volume is divided into several sections dealing with the general subjects of The Story of Wood, Shop Equipment, Processes, Joinery, Woodworking Machinery, Tool Sharpening, Wood Finishing, and Safety First. Excellent drawings and illustrations add to the clarity of the text.

The section on shop safety includes discussions of common woodworking hazards, first aid kits, power machinery, safe use of hand tools, fire prevention, and hygienic problems. Cartoon drawings are used to illustrate some of the major hazards. The book is available from the International Textbook Co., Scranton 9, Pa. for $2.98.

Fig. 11. Portable tilter. Note straight shank faucet.

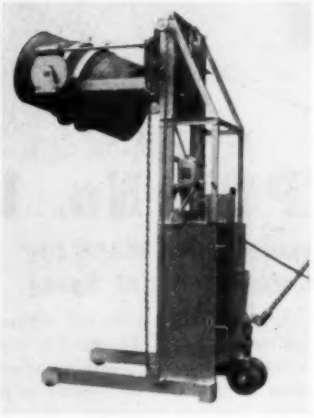

Fig. 12. Portable tilting and emptying device for discharging the contents of the drums into tanks.

Handling Metal Drums

(Continued from page 26)

emptying operation (See Figures 11 and 12).

Reuse of I.C.C. specification single-trip containers for regulatory products is prohibited, except under conditions prescribed for war emergency use by the Interstate Commerce Commission. Consult the I.C.C. Regulations or the Bureau of Explosives for complete details.

Empty drums intended for reuse or sale should have the closures tightly replaced and be stored in a safe location, away from heat or open flames.

Disposal Precautions

Empty drums previously filled with poisonous or flammable liquids and placed in unguarded storage lots have frequently been the cause of serious accidents.

Such drums should have their liquid and vapor contents completely removed prior to storage.

Pictures by courtesy of the Manufacturing Chemists' Association and the following companies: Title Picture, Texas Co.; Figs. 1 & 10, E. I. DuPont de Nemours & Co.; Figs. 2 & 5, Standard Oil Co. of New Jersey; Figs. 3 & 9, Vol-U-Meter Co.; Fig. 7, Palmer-Shile Co.; Figs. 8, 11 & 12, Lewis-Shepard Products, Inc.

Safety Record Requires Safe Conditions & Safe Workers

A VIGOROUS and continuous safety program has brought about further improvement in the already fine safety record at the plants of Sunshine Biscuits, Inc., Hanford Main, president, reported recently. Sunshine has continuously devoted many hours and spent thousands of dollars in promoting safety in the minds of its employees. That the company has succeeded is evidenced by the fact that the Sunshine accident record is consistently better than the average for the food industry.

As the production of food products requires giant machines, huge mixers, moving belts and conveyors, automatic packaging equipment, kettles, giant band ovens and many other huge mechanical devices, extraordinary safety precautions are necessary and are taken. Safeguards have been provided for practically every piece of equipment in all plants.

"But," Mr. Main stated "we want our plants and mills to be safe for all employees, and that is why we continually strive not only to maintain our present enviable low accident record, but to reduce it even further."

Sunshine's New York bakery, has won safety awards for three consecutive years. The company maintains a safety education program at all of its plants.

Effective Campaign

Recently, it was discovered that a particular type of accident was occurring too frequently. A committee investigated and discovered that the accidents were caused by the running of employees in the plant. A concerted campaign to stop this practice was set into motion; signs, posters and bulletins carried a "no running" theme. It was followed up by supervisors, which brought about a substantial reduction of these accidents. Movies were also used as part of the program to educate employees. Company safety engineers point out that repetition is a most effective way in which to make employees safety-conscious.

"Modern equipment has been designed and built with the cooperation of our safety engineers. This, plus the company's continuing safety program, has greatly eliminated all hazards and has been largely responsible for the outstanding safety record." Main concluded.

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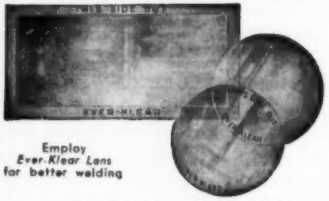

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Construction Safety Manual

THE Third Revised Edition of *The Manual of Accident Prevention in Construction* has been published by The Associated General Contractors of America, a considerably expanded and considerably more profusely illustrated document than its predecessors.

The purpose of its 264 pages and approximately 100 photographs and drawings, is summed up in the preface to the book:

"The objective of this Third Revised Edition is to make clear, by illustrations, specifications and simplified text, the safe way of performing construction work and to emphasize the costly results of incorrect, unsafe practices. No deviation has been made from previous editions with respect to the practical and common sense approach to the subject of accident prevention. The same sequence of subject matter has been observed, although new sections have been added.

"Keeping in mind the busy superintendent and foreman, the text has been reduced as much as is considered compatible with clarity. Numerous photographs, drawings and charts have been included; and new sections on Housekeeping, Oxygen, Acetylene and Hydrogen; Electric Welding, Power Saws; Explosive Gases and Liquids; Motor Graders, Bulldozers and Tractors; Boats and Barges; and Reference Tables have been included."

A member of the A.G.C. national staff devoted almost all of his time for one year to the job of revising the safety manual, working under the direction of the A.G.C. Accident Prevention Committee. Other cooperating groups and individuals included the National Safety Council, the American Standards Association, prominent safety engineers, leading insurance companies, the Safety Division of the Corps of Engineers, and individual A.G.C. members and staff members.

The Manual of Accident Prevention in Construction was first published in 1927 by the A.G.C., which was pioneering in its field. A First Revised Edition was published in 1930 and a Second Revised Edition in 1938. As presently revised, the manual is slightly larger in size than its predecessors. It has been so proportioned that the pages can be easily scaled down to provide pocket-size reprints of the individual sections. The new edition will sell for $3 postpaid, The Associated General Contractors announced.

New Products for April
See Pages 70-71

Course for Research Administrators

THE Department of Industrial Engineering of Columbia University, New York City, announced recently that it will conduct a five-day conference on the Costs, Budgeting, and Economics of Industrial Research from June 12 thru June 16 of this year. Experts from industry and the university will participate in lectures, discussions, and clinic sessions designed for the practical research and development administrator.

The conference is in addition to the regular evening course given in the administration of research and development, and is intended to supplement the work of the various groups and conferences already in the field and to provide practical material for the research executive and his assistants.

Additional information may be obtained by writing Professor David Bendel Hertz, Department of Industrial Engineering, 409 Engineering, Columbia University, New York 27, New York.

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A request on your letterhead will bring our complete PLY-GARB Catalog. Describe your operation — let us tell you whether PLY-GARB is suitable to your job.

Manufacturers of PLYGLOVS and PLY protective skin products.

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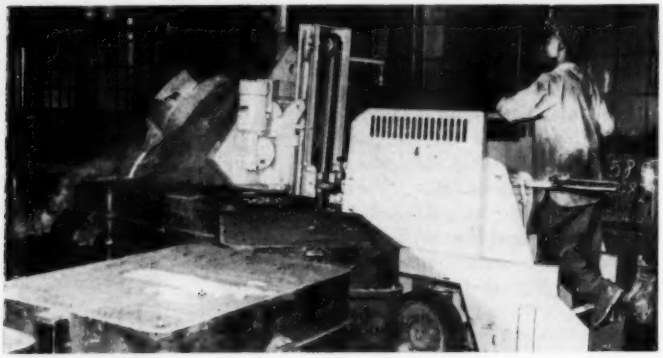
3245 E. Woodbridge, Detroit 7, Mich.

SAFETY ENGINEERING Salutes a Safety Idea for April



BY REPLACING an overhead ladle with a fork truck equipped with a rotating carriage for pouring, one Southern iron works has increased pouring operations approximately 50% and decreased work-hours 50%. The truck moves from flask to flask pouring molten metal as required. The entire operation is performed by the truck operator. He rotates the ladle to keep a constant flow of metal to the mold. When the former system was in use, two men had to push the ladle along the overhead rail and perform pouring operations. Now pouring operations are controlled by one man at a comfortable distance from the hot ladle.

The ladle has fabricated around its base four hollow rectangular steel tubes which permit the forks of the truck to pick up the ladle from any one of four directions. The tubular construction prevents the ladle from falling off the forks as it is tipped for pouring.

The 360° rotor has two speeds, the slowest speed giving added control when pouring metal. The ladle holds 4,150 lbs. and is 34½ inches in diameter by 39 inches in height. The truck is an end-controlled fork model of 54-inch wheel base, 83-inch mast height, and 54-inch overall width. The 6000-lb. capacity truck has a grade clearance of 3½ inches, and a turning radius, outside edge of truck, of 96 inches. Turning radius of the inside edge is 39 inches. Mast tilts 20 degrees to center the load. When not used for pouring operations, the truck is used for regular metal industry uses since the rotating device may be removed and standard forks installed.

Picture by courtesy of Yale & Towne Mfg. Co.

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Dionol Ointments melt at body temperature for almost immediate effectiveness.

Write for samples
DIONOL PHARMACAL COMPANY
Ferndale 20, Michigan

More Power to America

THE "More Power to America Special," first train of its kind in industrial history, will be launched on a nationwide tour this spring by General Electric's Apparatus Department.

Exhibits of more than 2,000 electrical products, processes and techniques ranging from precise aircraft instruments to complex working models of steel mill, textile and other industry equipment, will be displayed throughout nine cars of the train.

C. H. Lang, Vice President in charge of sales for the company's Apparatus Department, said the train will visit the country's key industrial centers for inspection by utility and industrial executives and municipal leaders. Since it is an industrial development enterprise, it will not be open to the general public.

Electricity Display

The displays will portray the latest advances in power generation and methods and equipment for the profitable use of electricity throughout all industry. They have been designed especially for those who produce electric power and those who put it to work in industry and the community.

Included in the exhibits will be turbines of all types—steam, gas and mercury; equipment for transmitting and distributing electric power, and motors and controls engineered into combinations that can perform a wide variety of industrial operations. Other displays will include precise measuring and recording instruments; new developments for community improvement, such as street lighting and sewage treatment equipment, and products which contribute to national security.

Manlift Safety Code

A NEW Safety Code for Manlifts is announced by the American Standards Association, 70 E. 45th St., New York 17, N. Y. The new code is a consensus of the experiences of manufacturers, users, insurance groups, enforcement officials, and independent specialists. It was sponsored under ASA procedure and consensus principle, by the Association of Casualty and Surety Companies and The American Society of Mechanical Engineers. It is believed to be the first guide on this subject ever to be published.

The code was developed as a guide for state and municipal authorities in drafting regulations for the use of manlifts, where their use is now permitted. It is also intended as a standard reference on safety requirements for manufacturers, architects, plant designers and consulting engineers, and for users of the equipment.

Construction, maintenance, inspection, and operation of manlifts in relation to accident hazards to industrial workers are covered by the code. It includes general requirements for design and installation, mechanical requirements, automatic safety devices, emergency controls, recommendations for instruction and warning signs, operating rules, and tests. The Manlift Safety Code, ASA A90.1-1949, is available at 55 cents per copy.

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Fire Equipment Is A Good Investment

A NEW low in occurrence and severity of fires was established during 1949 by the Hilton-Davis Chemical Company Division, Sterling Drug Inc. Chester H. Allen, safety director, in a review of the year, reported only three fires causing damage enough to file claims, which totaled $3,300. Better than any past year since the division has grown to its present size of 22 buildings on 80 acres, the record is considered unusually good for a plant working constantly with many solvents and chemicals.

Harry Hughes is the division's safety inspector and chief of the volunteer firemen, numbering 42 employees covering three shifts. All buildings are provided with automatic sprinklers, using wet or dry systems to suit the need. There are 45 strategically located portable extinguishers provided with carbon dioxide or dry powder. Eleven fire houses on the plant site are equipped with hose, fire tools, and a selection of nozzles. Many of the nozzles are of the spray type, delivering either a solid stream or a regulated water spray. The water spray is particularly useful in fighting fires in oils or solvents, and greatly reduce water damage, according to Mr. Allen.

Throughout the 22 buildings in many locations one-inch hand hoses are also available for immediate emergencies. Four of these are equipped with spray nozzles.

The plant has been divided into four numbered fire areas. Thirty-five fire alarm boxes are connected by a central station service organization to the Cincinnati Fire Department. The control center immediately gives the location of the fire to the plant's boiler room. The fire whistle then blows the alarm, telling where the fire is. The alarms are tested and the volunteer brigade assembled with frequent drills.

Newest fire fighting equipment now being installed is an especially designed carbon dioxide flooding system protecting a new dowtherm heating unit in the varnish plant. In this plant the large kettles are all protected by permanently piped cylinders so arranged that in case of fires they can be flooded instantly with carbon dioxide. The new equipment brings to five the total number of this type of protection in the varnish building. Additional protection is provided by five hose lines, four equipped with spray nozzles.

Charleston, W. Va.

Annual West Virginia State-Wide Safety Conference, April 5–8. W. C. Easley, managing director, W. Virginia Safety & Health Council, 316–17 Masonic Bldg., Charleston, W. Va.

Columbus, Ohio

Twentieth All Ohio Safety Congress and Exhibit, April 11–13. (Neil House). James H. Fluker, congress chairman; G. S. Kallenbaugh, congress manager, 65 S. Front St., Columbus 15, Ohio.

Buffalo, N. Y.

Tenth Western New York Safety Conference and Exhibit, April 12–13. (Hotel Statler.)

Bridgeport, Conn.

Fifth Annual Connecticut Industrial Safety Conference, April 13. (Stratfield Hotel). Donald Ackley, manager, G. & O. Manufacturing Co., New Haven, Conn.

St. Louis, Mo.

Central States Safety Conference, April 18–20. (Hotel Jefferson). Reyburn Hoffman, Secretary-Manager, Safety Council of Greater St. Louis, 511 Locust St., St. Louis.

Chicago, Ill.

Thirty-fifth Annual Convention of American Association of Industrial Physicians and Surgeons, April 23–29. (Hotel Sherman). Dr. Edward C. Holmblad, 28 E. Jackson Blvd., Chicago 4, Ill.

Chicago, Ill.

Annual Conference of American Association of Industrial Nurses, April 23–29. (Hotel Sherman). American Association of Industrial Nurses, Inc., Room 909, 654 Madison Ave., New York 21, N. Y.

Toronto, Ont.

Annual Convention International Accident Prevention Associations, April 24–25. (Royal York Hotel). R. B. Morley, General Manager, International Accident Prevention Associations, Toronto 2, Ont.

Fort Wayne, Ind.

Seventh Northeastern Indiana Safety Conference & Exhibit, Apr. 25–26. I. L. Denton, Mgr., Chamber of Commerce Safety Council, 826 Ewing St., Ft. Wayne 2, Ind.

Allentown, Pa.

Twenty-third Annual Eastern Pennsylvania Safety Conference, May 2. Harry C. Woods, executive secretary, Lehigh Valley Safety Council, 602 E. 3rd. St., Bethlehem.

Chicago, Ill.

Twenty-seventh Annual Midwest Safety Show, May 2–4. (Hotel Sherman). Joseph F. Stech, Manager, Greater Chicago Safety Council, 10 N. Clark St., Chicago 2, Ill.

Pittsburgh, Pa.

Twenty-fifth Annual Western Pennsylvania Safety Engineering Conference, May 2–4. (William Penn Hotel). H. H. Brainerd, Executive Manager, Western Pennsylvania Safety Council, Chamber of Commerce Bldg., Pittsburgh 19.

Charlotte, N. C.

Twentieth Annual North Carolina Statewide Industrial Safety Conference. May 3–5. (Hotel Charlotte). H. S. Baucom, Safety Director, North Carolina Industrial Commission, Raleigh, N. C.

Baltimore, Md.

Maryland State-Wide Safety-Health Conference and Exhibit, May 4–5. (Lord Baltimore Hotel.) Joseph A. Haller, executive chairman, State Industrial Accident Commission, Equitable Bldg., Baltimore 2, Md.

Detroit, Mich.

Twentieth Annual Michigan Safety Conference and Exhibit, May 15–18. (Book Cadillac Hotel). S. M. Foeller, executive secretary, Michigan Consolidated Gas Co., 415 Clifford, Detroit 26, Mich.

Duluth, Minn.

Twenty-sixth Annual Lake Superior Mines Safety Council, May 18–19. (Hotel Duluth). John A. Johnson, supervising engineer, U. S. Bureau of Mines, 18 Federal Bldg., Duluth 2, Minn.

Roanoke, Va.

Sixteenth Annual Virginia State-Wide Safety Conference, June 1–3. (Hotel Roanoke). W. W. Myers, managing director, Richmond Safety Council, Allison Bldg., Richmond 19, Va.

Washington, D. C.

President's Conference on Industrial Safety, June 5–7. (Dept. of Labor Auditorium.) Secretary of Labor Maurice J. Tobin, general chairman of the conference.

Boise, Idaho

Western Safety Conference, June 18–20. L. M. McKay, Vice-President, Western Safety Conference, P.O. Box 1038, Boise, Idaho.

Chicago, Ill.

Thirty-eight Annual National Safety Congress and Exposition, October 16–20. (Stevens Hotel). R. L. Forney, general secretary, National Safety Council, 20 N. Wacker Drive, Chicago 6, Ill.

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The Wise Owl Sees All

A TOTAL of 787 industrial workers — 783 men and 4 women who saved their sight by remembering to wear safety glasses —have qualified for membership in the Wise Owl Club of America since it was organized 16 months ago, the Industrial Advisory Committee of the National Society for the Prevention of Blindness reported following a meeting in New York recently. The Wise Owl Club is one phase of the sight conservation program in industry sponsored by the National Society for the Prevention of Blindness.

"The 787 workers who are now members of the Wise Owl Club are from 152 different industrial plants located in 33 states and Canada," according to Dr. Leonard Greenburg, Chairman of the Committee. Dr. Greenburg is Executive Director of Industrial Hygiene and Safety Standards of the New York State Department of Labor. "The accidents prevented represent an estimated saving to industry of more than $2,000,000 in compensation costs alone—to say nothing of medical costs, lost production, and the loss in human suffering that cannot be calculated," he said.

At the meeting in New York, the Industrial Advisory Committee reviewed the activities of the Society's eye health program during the past year, and discussed plans for an intensified campaign of sight conservation in industry to reduce costly eye accidents; and to increase production efficiency by reducing eye fatigue and by fitting the man to the job according to his visual skills.

The committee's report revealed that there are an estimated 300,000 eye accidents occurring each year in American industry, with some 1,000 resulting in blindness in one or both eyes. The economic loss due to eye accidents, for both employers and employees, runs to more than $250,000,000 a year.

The Wise Owl Club was started in 1947 at a St. Louis plant of the American Car and Foundry Company. The following year the company proposed that the National Society for the Prevention of Blindness sponsor the club as a national movement. In the 16 months since that time, membership has jumped from 76 to 787. Any company can set up a Wise Owl chapter by applying to the National Society for the Prevention of Blindness, 1790 Broadway, New York 19, New York.

Concerning the importance of a complete goggles program, the committee cited the experience of the Sperry Gyroscope plant at Great Neck, N. Y., where not a single eye has been lost since the inauguration of a vision program in 1944. A showcase at the plant displays more than 30 badly mangled safety glasses, indicating that at least a dozen eyes might have been lost if glasses had not been worn.

Hospital Fire Inspections

MORE than 1359 hospitals throughout the country have been inspected for fire and casualty hazards since the start of the nation-wide hospital inspection program being conducted by the capital stock insurance business. In each of these institutions, two or more inspectors have examined fire hazards and hazards to life, making practical recommendations for improvement of the hospital's safety wherever it was found necessary.

In addition to these 1359 hospitals, whose inspections have just been reported to the Special Committee on Hospital Inspections of the National Board of Fire Underwriters, more than 3000 hospitals are scheduled for inspection in the near future. Surveys made by insurance boards and bureaus in cooperation with the American Hospital Association indicate that there are nearly 9000 hospitals that will be inspected before the program is completed.

About 1700 engineers and field men from the capital stock fire insurance and casualty insurance companies are engaged in this nation-wide inspection project to prevent hospital disasters. The program is under the direction of the National Board of Fire Underwriters.

"The scope of these inspections goes beyond the correction and elimination of hazards to life," says Col. Perrin C. Cothran, chairman of the Special Committee on Hospital Inspections.

"We hope that one of the most lasting results of the inspections will be improvements in the training of hospital personnel and increased consciousness of fire dangers on the part of all who operate hospitals.

"How important this can be was demonstrated only a few weeks ago when fire destroyed part of the Sauk County Hospital, near Reedsburg, Wis. Employees of that hospital had been trained in fire safety. While three employees fought the fire with inside hose lines, other employees removed 100 mental patients from the building. Help was quickly summoned from nearby fire departments.

Hospital Saved

"Later this emergency was so well under control that employees and some of the mental patients were able to enter the building to remove all mattresses, bedding, clothing and store room supplies. In case the whole building had been destroyed, these supplies would have been available for the patients in other quarters.

"Fortunately the building was saved and not a patient lost his life nor was injured.

"According to the report of the fire insurance rating bureau on this fire, the hospital superintendent is to be credited for instigating fire drill and training programs, and for instilling a spirit of patient safety consciousness in all employees. The efforts of all concerned prevented what might have been another disastrous hospital fire," Col. Cothran said.

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Galveston Army Engineers Have "Safe" Year

THE Galveston District of the Corps of Engineers reported that the 1949 calendar year was one of its "safest." Completing 7,000,000 man hours of construction work throughout Texas, statistics reveal that there were only 11 injuries per million man hours. Latest construction industry average is 24 accidents per million man hours.

The Galveston District of the Corps of Engineers is engaged in the construction of eight flood control projects: San Angelo Dam near San Angelo, Texas; Whitney Dam near Waco, Texas; Belton Dam near Belton, Texas; Dam B near Jasper, Texas; and Benbrook, Grapevine, Lavon and Garza-Little Elm in the upper Trinity watershed. In addition to military and dam construction activities, the Galveston Engineers are also engaged in the improving of rivers, harbors, and waterways along the Texas Gulf Coast.

Contractors engaged in the construction of the Grapevine Dam worked 300,000 man hours without a loss-time injury, an outstanding safety record.

The dredges "Miami" and "Burlington," owned by the Standard Dredging Company, operated without a single accident during the past calendar year.

An extensive safety program is under way to further safe operations in all activities of the Galveston District. N. H. Jensen is the district safety engineer. The Galveston District's safety record led the Corps' Southwestern Division, comprising Texas, Oklahoma and parts of Arkansas, Missouri, New Mexico and Kansas.

Bureau of Labor Standards Promotes Safety

AS A practical means of contributing to a solution of the Nation's safety problems, the Bureau of Labor Standards, through its Safety Standards Division, is engaged in an active program of safety promotion covering many problem areas.

The Bureau's services are rendered primarily to State agencies administering labor laws and are designed to strengthen State services to management and labor where the actual safety problems must be resolved. One of the successful developments in this field is the special industry safety program of the Bureau, in which safety technicians cooperate with States in planning specialized safety programs for use in high-hazard industries. Results obtained thus far by States conducting these programs show that reductions vary from 7 to 29 percent in injury-frequency rates for entire industries within a State. These reductions achieved in a 6-month or 1-year period seem indicative of their practical value in accident prevention work. Nine special industry programs have been developed and are now available to States, and it is the plan of the Bureau to develop a number of additional programs this year in still other high-hazard industries. Special industry programs in this current year will be used by more than 16 States.

Training Courses

The Bureau's revised training courses in safety techniques bring to State safety inspectors the latest methods of safety promotion and control procedures. Through this series of 1-week instruction periods, inspectors in 25 States will benefit by increased practical safety knowledge this year. To accomplish this, approximately 55 separate classes will be held in these States. As a still further contribution to the cause of safety, the Bureau is providing increased assistance to States and other agencies in the development and revision of safety codes and standards, and technical staff members of the Bureau will continue to serve individually on many code committees concerned with the field of safety standards.

City Employee Safety

THE safety record of New York City employees now ranks third among those of eight large cities with accident control programs. These figures were released as the municipal government's safety program entered its third year of operation, under the direction of Alfred R. Lateiner, accident control consultant for the City College extension division.

New York's "lost-time" injury rate for 160,000 municipal employees is 23.6 per million man-hours, according to records for the period from July, 1948 to June, 1949. This figure is surpassed only by Detroit with 15.9 and Akron with 22.7, and outranks the figures for Milwaukee, San Diego, Tucson, Bangor, Phoenix and Baltimore.

In two years of operation, more than 5,000 supervisors have been trained in 15 municipal departments, covering 56 per cent of the city's work force. Five departments—Sanitation, Public Works, Correction, Fire and Police—have been in the program since 1948.

Do
You
Have
Accident Problems?

See Page 16

"PEP-UP" Impregnated (controlled dissolving) SALT TABLETS offer an amazing advancement in salt tablets. The controlled dissolving releases some salt immediately, which insures quick salt replacement, but not in sufficient quantities to cause nausea. Write for literature and prices. Available in Expendable—throw away Dispensers.

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LEARNING THE

MECHANICAL FAILURE

YOU may be proud of the way your car or truck looks, but it's really what's under that new paint job that counts. For example, if the steering mechanism is not in perfect condition, you may find yourself in the same position as this unhappy driver. The motorist was about a half-block from his stopping place when his car suddenly turned sharply to the right and crashed into a car parked by the curb. The mystified driver, who had been unable to control his vehicle, discovered that the knuckle joint on the steering gear had broken and fallen down, causing the front wheels to turn. Was the driver at fault? He may have not been responsible for the broken joint, but he certainly was responsible for not having the vehicle properly inspected and maintained.

LOOSE FUSE CLIPS

LOOSE fuse clips holding a cartridge fuse were responsible for the loss of a night's production in several departments of a large New England woolen mill. The poor contact at the clip resulted in excessive heating of the fuse which probably caused the enclosed fusible element to give way at one end. Arcing at this point gradually spread along the fusible element until the fuse casing was destroyed. This arcing ionized the surrounding air, establishing a conductive path to an adjoining fuse, and a short circuit occurred.

Arcing ignited insulation on near-by wiring and the fuse panel was so badly damaged that replacement was necessary. The circuits involved provided light for the carding and combing departments and a shift and a half of production in these departments was lost. Total damage amounted to about $6500.

Fuse clips should be maintained clean and tight at all times.

OIL-SATURATED CLOTHING

AN EMPLOYEE started oil well pumping against a closed flow line, causing the gasket to blow on the stuffing box. He shut down the pump motor and tried to tighten the stuffing box rubbers to prevent oil and gas from spraying out of the gasket. His clothing became saturated during this work. After completing the operation, he finished his rounds of wells and tank batteries, and returned home. After finishing his evening meal, he started out of doors, stopped to light a cigarette by striking a match on the screen door. His clothing ignited, and the employee later died as a result of second and third degree burns.

When an oil worker's, or anybody's, clothing becomes saturated with oil or any other flammable material, they should change clothing as soon as possible and be certain that they do not expose themselves to sources of ignition. In this particular case, pumping wells,

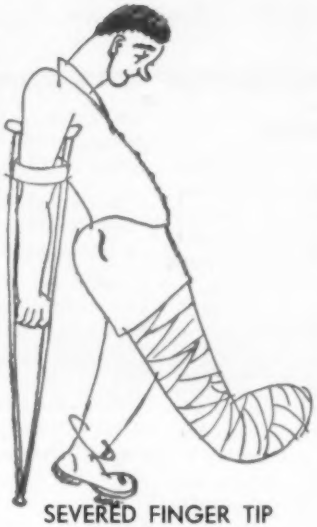
HARD WAY

equipped with flow line valves at the well, should not have the pumping units started on a closed valve. It should also be determined that the header valve at the tank manifold is open before turning pumping wells into the flow line.

OIL DRILLING ACCIDENT SHOWS SCAFFOLD NEED

DURING oil drilling operation, a rotary had been moved from over the hole, and disconnected flow line and valve were lying on the ground. An employee under the derrick floor assisted the crew in sliding the rotary beams to the side with a catline. After moving the beam, he stepped down and onto a wet, muddy sill. His foot slipped, sending him sprawling over the disconnected flow line which struck him across the chest and under the right arm, fracturing a rib.

This accident illustrates the need for using temporary scaffolds or platforms. With proper rigging for moving the beam or with a safe platform, the accident could have been prevented. The workmen were also at fault for failing to clean up the slippery work area.



SEVERED FINGER TIP

AN EAST coast shipyard employee was securing the wire-mesh guard around a crane engine fan when one of the bolts slipped from his fingers. Without thinking, he reached in to retrieve his bolt, and while doing so his finger came in contact with the revolving fan blade.

Years ago, when the safety movement was just getting started, one of the first unsafe acts noted was the placing of members of the body in the path of moving machinery parts. Since that time there has been an increasing campaign to get workers to shut off machinery before making repairs, adjustments, etc. Why, in spite of all the evidence presented, workers still insist on gambling with their hands and lives in this way is beyond comprehension.

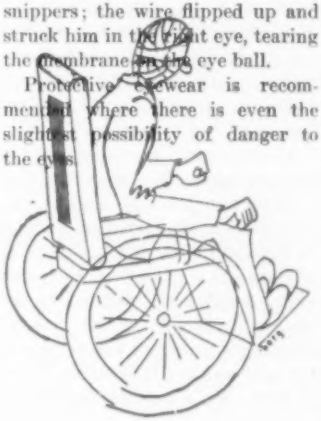
PUTTING THE BITE ON

TWO days after a first-aid instructor had graduated a crew of field men, one of them was bitten by a rattlesnake. Heavy rains had made driving impossible and the men had to walk through a wooded area to reach transportation. The last man in line, feeling something strike his leg, looked down to see a rattlesnake hanging by a fang to his trouser leg! The recent graduates of the first-aid class acted promptly. One man applied a tourniquet while another hurried for the snake bite kit which made possible the cleaning of the wound by making it bleed. Fortunately, this man was with a well-equipped and well-trained group.

NEEDLESS HAZARD

ROUSTABOUT at gasoline plant was cutting off piece of No. 14 galvanized wire from coil of wire. He stretched it out and reached down and cut it off with wire snippers; the wire flipped up and struck him in the right eye, tearing the membrane on the eye ball.

Protective eyewear is recommended where there is even the slightest possibility of danger to the eyes.



industrial Hygiene

ASSOCIATE EDITOR
JACOB A. GOLDBERG, A.M., Ph.D.

Techniques of Plant Maintenance

PUBLICATION of the text of the most comprehensive discussion of problems of plant maintenance ever undertaken was announced recently by Clapp & Poliak, Inc., the management of the Plant Maintenance Show which was held in Cleveland, O., in January. The two-volume text, "Techniques of Plant Maintenance—1950," are the proceedings of the first Plant Maintenance Conference held concurrently with the show.

Thirty outstanding experts in various fields of maintenance led the conference and about 8,000 executives concerned with plant maintenance attended. The two volumes comprise 278 pages, and include 47 pages of tables, diagrams, illustrations, graphs and charts. Five hundred and *(Continued page 65)*

Industrial Medicine Degree

THE first degree of Doctor of Industrial Medicine ever awarded was granted three doctors recently by the University of Pittsburgh School of Medicine. The occasion was hailed as a "historic step forward in the recognition of industrial medicine and surgery as one of the great and recognized specialties in the medical profession" by Dr. J. D. Willems, of the American Association of Industrial Physicians and Surgeons.

The three who were graduated from the specialized post-graduate course were Drs. Harley S. Gibbs, Dolor J. Lauer and James H. McDonough.

Gibbs was graduated in medicine from Pittsburgh in 1945 and is now in charge of the medical division of Carnegie Illinois Steel Corporation. Gibbs studied under a fellowship granted by the Mine Safety Appliance Company, which was represented by the company's president and treasurer, George H. Deike.

Lauer took his M.D. at the University of Minnesota in 1938. He is now medical director of the National Lead Company and is doing research in occupational diseases at the Kettering Laboratories of the University of Cincinnati.

McDonough took his M.D. at the University of Pennsylvania in 1942 and is now medical director of the Rome Cable Company, Rome, N. Y.

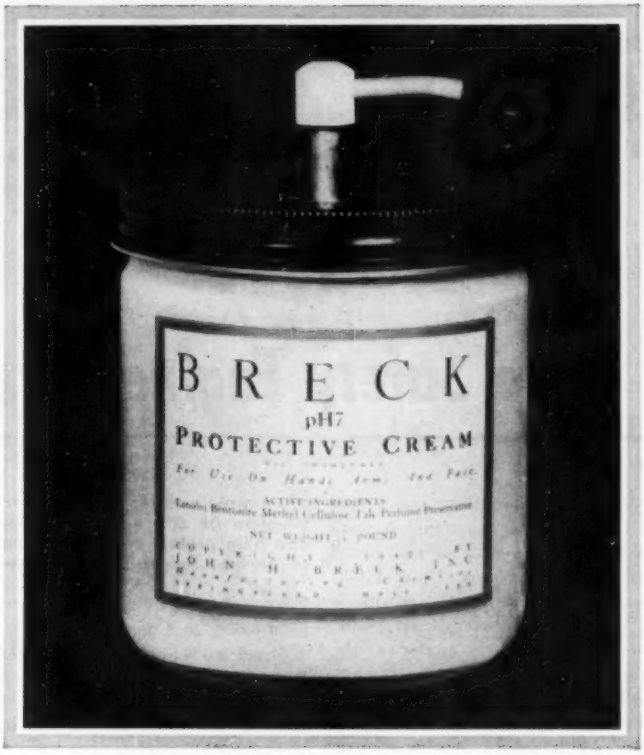
Lauer and McDonough took the advanced course under fellowship grants from the James S. Kemper Foundation. The Foundation was represented at their graduation by H. L. Kennicott, secretary of the Kemper group of insurance companies, and Dr. Willems, chief surgeon of the companies and a member of the fellowship committee of the American Association of Industrial Physicians and Surgeons.

Industrial Hygiene & Human Relations Course

THE University of Michigan School of Public Health is offering an inservice, non-credit training course in Industrial Hygiene and Human Relations for Safety Personnel on June 19–21. This is the second course that has been given for safety personnel, but the first to feature human relations in connection with accident prevention.

The course is being given at the request of a group of safety directors who feel that: 1. Fundamental concepts of human relations are basic to successful administration of safety programs, and 2. All safety personnel should have sufficient information regarding occupational exposures to recognize the existence or possibility of a health hazard. Emphasis will be placed on recognition rather than correction of health exposures for which the advice of industrial hygienists should be utilized. Practical applications are sought through the inclusion of process engineers and management on the special faculty for the course.

Included in the course will be sessions dealing with the general aspects of human relationships; personal sanitation facilities; plant *(Continued on page 68)*



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The Safety Engineer vs. Smog

No simple answer can be given to the complex problem of city smog. But the Safety Engineer can help protect the public health by doing more to prevent industrial air-contamination.

ATMOSPHERIC contamination in our cities and industrial areas is of growing concern today as more people live in bigger cities with denser motor traffic and diversified factory activities. Up to $100,000,000 is being spent annually in the United States by industry and municipalities to combat air pollution. There is more scientific study underway in this phase of public hygiene than ever before, but much more research is needed and more is indicated. American cities get pure drinking water, pure milk, sewage disposal, fire and police protection because these are recognized as civilized necessities which the taxpayers will pay to have. We should have this kind of public support for air pollution control.

In its public safety and health aspects, it behooves the safety engineer of industrial plants to acquire a knowledge of his local smog problem, and how the effluent wastes of local industry can aggravate the air pollution. His foremost responsibility is preventive engineering to minimize or control the effluence of factory gaseous wastes which sully the local atmosphere and contribute to what can be a bad nuisance on occasions. Smog situations vary from locale to locale, depending upon the character of industrial activity, weather conditions and topography. Probably much of the air pollution is caused by vehicular traffic which not only stirs up dust but exhausts, at street level, volumes of fumes.

What Can the Safety Engineer Do?

The safety engineer can serve his employer, and his civic responsibility, by obtaining careful and correct analysis as to the nature and behavior of the major pollutants in the atmosphere of his industrial community. He can stimulate the necessary action by public authority to see that the local atmosphere is sampled and analyzed often enough to furnish him with correct information as to what contaminants are present, and to what extent, under varying conditions of weather and factory activity. *Accuracy* of such information is imperative, for when correctly informed the safety engineer and preventive technology is better qualified to urge cooperative civic programs for effective abatement and prevention.

The safety engineer can contribute toward educational endeavors in specific factories for minimizing or controlling the chimney effluents. However, he is obligated to possess the proper knowledge and perspective, and to judge the atmosphere contamination in the light of common sense. Overanxiety and popular fears from the smells and eye-smarting of a bad smog should be avoided. On the other hand, the safety engineer must be cognizant of the true nature of the hazards which can become serious when, as, and if meteorological conditions are conducive. The tragedy at Donora, Penna., was a consequence of rare and extreme circumstances, but it dramatized what *can* happen when weather, topography, and local industrial wastes "gang-up."

My purpose herein is to plead for the exercise of educated common sense in considering the nuisance of air pollution as a problem of public hygiene. The abatement of visible smoke, insofar as it contributes to smog, is an old story. Smoke symbolizes economic waste, and is a result of inefficient combustion of the hydrocarbon fuels. Objectionable smoke does not occur when fuels are burned efficiently in equipment which is properly adjusted and managed with understanding. Effective smoke abatement is largely a human problem, and even when it is vigilantly abated, a city may still have smog due to the complex of fumes, gases and dusts mixed-up in the air with the visible solid particles.

By DR. A. J. LANZA,
Chairman, Institute of Industrial Medicine,
New York University-Bellevue Medical Center,
and
Chairman, Council of Industrial Health,
American Medical Association

Fumes and Gases

Now let us define what we are discussing in this complex of atmospheric pollution. In general, the contaminants are of two categories.

There are the fumes, gases and vapors in the air. Usually these unseen pollutants originate as wastes from industrial activity, and presumably an unmeasurable proportion result from urban motor traffic. These gases, vapors and fumes can, when weather conditions are conducive, cause smarting of peoples' eyes and irritations of the upper breathing tracts. Under rare and singular circumstances, sickness and death can ensue.

In this category are carbon monoxide, carbon dioxide, sulphur dioxide, hydrogen sulphide, and such groups of fumes as the nitrous oxide, hydrochloric, fluoride, ammonia and those typified by carbon tetrachloride and the solvents, as benzol. Ordinarily they do not exist in sufficient quantities to cause acute manifestations. Many of these contaminants float in the atmosphere in minute traces.

Whether these contaminating vapors and gases produce chronic effects on peoples' health, especially of the very old and of children, is questionable. It may be theorized that unfavorable effects would be discernible in persons already diseased, as the tuberculous, or the superannuated. However, the evidence is inconclusive, by and large. In the event of an irritating smog it is those persons having allergies, as asthmatics, who are prone to suffer most obviously.

In the event of emergency, administering to affected persons implies symptomatic treatment of the resporatory irritations. In case of serious lung irritation, it implies the use of oxygen.

The dramatic tragedy at Donora proves that a combination of circumstances can bring about a local disaster. From time to time eye-nose-throat irritations are attributable to atmospheric contamination in industrial areas.

Dust Contaminants

Particulate matter is the second category of air pollution. In this group are variously the unburned carbon from inefficient combustion in the internal combustion engine and in heating equipment, and the fly ash, silicates, metallic oxides and visible particle-stuff from innumerable sources, including building activity and wind-blown dusts. These figure as nuisances rather than in the public health and safety field. This particulate matter consists generally of particles too large to intrude into the final lung passages, and they are mostly inert insofar as toxic effects are concerned.

Loose and injudicious statements have been made to the effect that smoke may be a substantial cause for cancer of the lungs. We should suspect those who might misuse statistics for propaganda purposes. Present knowledge is mostly conjectural as to whether

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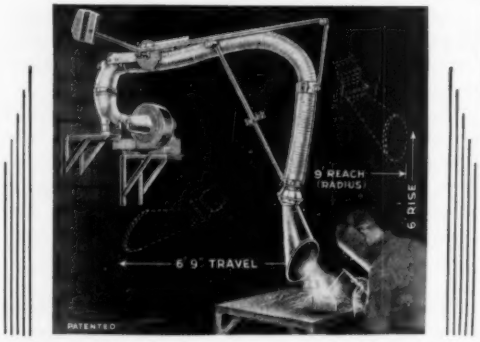

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air pollution, including smoke, may or may not be a cause of respiratory cancer. Authoritative data is lacking which would indicate that it is, and even that there exists any correlation between the two.

It is true that the crude death rate from cancer of the respiratory organs has been increasing, but this trend has not been confined to localities having smoggy atmospheres. It has occurred in all sections of the country. Consider that the trend has been much more rapid among males than among females. One would expect that if the increase were caused by atmospheric contaminants breathed by both sexes then the female would be affected equally with the male.

A likely explanation is that the number of individuals in the age groups in which cancer largely occurs has been increasing, and in consequence more cancer deaths are being reported. Diagnostic facilities are much better today, so more cases are discovered than was possible a decade ago. Since these diagnostic facilities are more frequent in cities than in rural areas, it is not surprising that more deaths are attributable to lung cancer in cities than are reported for rural areas.

Atmospheric pollution prevails in varying extents in every city of any size. According to the American Municipal Association, only four American cities of over 25,000 population have not established some form of air pollution control. Historically this has evolved as smoke abatement, but today enlightened opinion realizes that smoke, being visible, receives too much blame in popular misconception and that smoke is only a part—and a largely controllable part—of the broader vexation of smog.

The electric utilities of the nation have been leaders in smoke abatement endeavors, and have devoted perhaps $90,000,000 to air pollution control. Their efforts are largely for installation of fly ash and dust collectors. Consolidated Edison Co. of New York has for years been pursuing a long-range program, and is supporting researches at the College of Engineering at New York University. Likewise Commonwealth Edison Co. of Chicago had done considerable work, including the supporting of significant researches. The Chicago utility and the Detroit Edison Co., and probably others, have developed commercial sales outlets for "by-product" fly ash.

Sulphur dioxide is a commonly noxious nuisance among the invisible fumes and gases which contaminate the atmosphere, and up to now the answer is not known for recapturing this SO_2 on a commercial or non-prohibitive cost basis.

Methods for Abatement

Of concern to the safety engineer are the different devices for controlling or abating discharges of pollutants. The electrostatic technique has widespread application. There are wet process, mechanical cyclonic separators, thermal methods, vacuum cleaner and baffle-plates techniques. Sonic agglomeration

using high frequency sound waves appears to have promise, mainly for collecting-out the ultra-fine solid particles. Bituminous Coal Research, Inc., sponsors its modern version of the overfire air/steam jet for smokeless combustion.

It is within the functional scope of safety engineering to not only adapt devices and techniques for minimizing the effluence of stack wastes, but also to participate in the public health educational endeavors of a community. The public must be correctly informed. I advise common sense considerations of the problems and hazards involved, yet without encouraging overanxiety or alarm. The safety engineer should be cognizant of the potentiality implicit in the sometimes serious hazards at such times when circumstances combine to render them dangerous to the community health.

As a matter of common sense, human beings have contended against polluted air ever since Adam and Eve lived in the Garden of Eden. Even the air around a mountain-top, or an island in the ocean, carries dusts, plant spores and such. For centuries before industrialization men breathed foreign particles arising from the ground, or stirred up by farming and the natural processes, as plant pollinization. Man has a fairly effective defensive mechanism, but he has survived because the air has diluted his exposures to air-borne substances enough to render them tolerable, or even harmless. Wherever man lives and works his activities pollute the atmosphere. The American people today suck into their respiratory tracts huge volumes of tobacco smoke. They drive millions of motor vehicles which, in mass effect, probably contribute more dust and fumes at the breathing level than do factory chimneys.

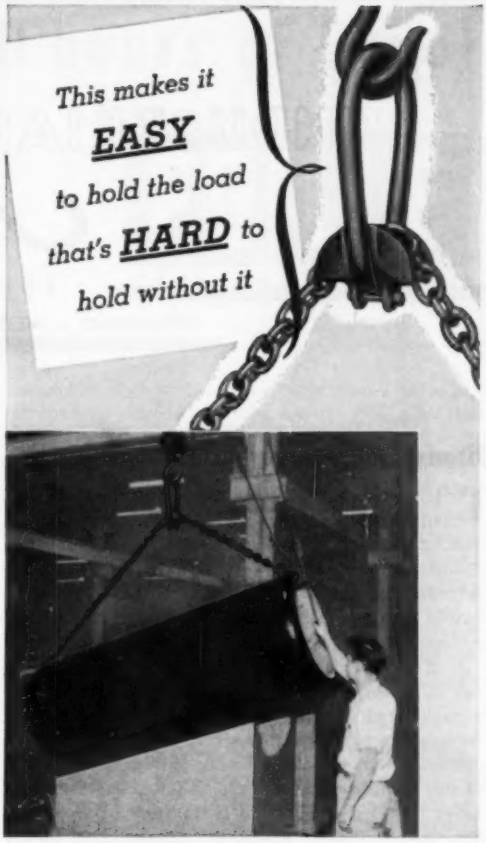
There is a great undertaking ahead to control this growing problem. Let us hope that engineering know-how and research, public health endeavors and public support can develop atmospheric hygiene into one of the effective fields of applied science.

Techniques of Plant Maintenance

(Continued from page 60) fifty-four questions submitted by the audience are answered in the second volume.

The books are available from Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y. Price for both, postpaid, is two dollars.

Subjects covered include maintenance organization and principles; maintenance costs and budgeting; selection and upkeep of lighting equipment; upkeep of motors, controls and distribution equipment; use of electrical instruments in maintenance; upkeep of floors, walls and roofs; relationship of lighting and color to production; sanitation and housekeeping; lubrication; application of service equipment; protection of plant and worker, and the importance of maintenance to safety.



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EDITOR

ROSAMOND J. WEBSTER, R.N., A.M., Ph.D.

Diseases of Adaptation

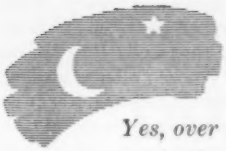
THIS is the name that has been given to a group of conditions indicating morbid reactions resulting from exposure of the human organism to various types of stress. By the term "stress" is implied such factors as trauma, extremes of heat and cold, light, acute and chronic infections, drugs, physical and mental fatigue, and emotional disturbances. As is evident, this covers a lot of territory and may include a considerable portion of a working force in some establishments. An example cited as an end-result of a stress situation is the case of a patient with a severe generalized form of alopecia areata, or baldness, without demonstrable skin lesions. In his case the alopecia followed exposure to a severe bombing incident in a war zone. His mother developed the same condition when he was nearly killed in a childhood accident. Her sister developed the same condition of baldness after the severe illness of her only child, and a brother suffered the same condition after an accidental injury. Some diseases are reported to be due to lack of adaptation while others, such as hypertension and arthritis, are assumed to be the result, in some instances, of excessive or abnormal adaptive reactions to the environment. In such instances it is assumed that the pituitary-adrenal body mechanism is involved in over-adaptation. The recent experimental work with cortisone and related products is beginning to throw some light on these problems. Many research projects have been initiated throughout the country. Much light may be thrown on these problems in the next few years.

Looking at Accident Proneness

ACCIDENT prone individuals, or those presumed by some to be so, have been the subject of considerable study and discussion. As viewed by a group of psychiatrists, the concept of accident proneness holds that the majority of accidents occur as the result of subconsciously intended actions on the part of certain personality types. It is suggested that accidents are caused by deep-seated psychological conflicts in the individual, rather than by physiological or environmental conditions. Others have questioned this viewpoint. They point out that all accident-prone individuals are not necessarily characterized by personality disorders. Individuals who have unusual predilection for injury may reveal a vast number of pertinent biological conditions, such as fatigue, transient emotional stress with resultant inattention, impaired vision or hearing, underlying disease, etc. Individual cases of carelessness and incompetence that may be psychologically determined, reflect immediate economic, social or domestic pressures as well as complex psychological situations that may be deep-seated. Acceptance of the first concept, if done on an all-inclusive basis, fails to take into consideration these and other factors well known to medical department personnel and safety engineers. Aside from the simple accident, which has an easily recognizable cause, or so-called "acts of God," it is evident that many factors are involved. The environment is one, the complexity of the individual is another. Together, this combination contributes much to the sum total of accidents in industry. Many require training in recognizing which are the more important environmental situations, the "inner" man, or some combination of both. The careful compilation of individual accident reports and their detailed analysis by those competent in such work may throw some light on individual situations.

Industrial Safety & Health

THE sixteenth national conference on Labor Legislation was held three months ago, and made a number of important recommendations. Some of these are of distinct concern to medical and related personnel in industry. Among the recommendations reported upon are the following: (1) Each state not now having



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a basic safety law should enact legislation authorizing its labor department to render work places safe and empowering such departments to promulgate codes as a foundation for effective safety performance in establishments of the state, (2) Each state should provide advisory services to management and labor in the promotion of safety, and the personnel charged with legal responsibility for securing observance of regulations render this service, (3) Each state should provide more adequate appropriations for state labor department safety programs to insure a sufficient number of well-trained competent personnel, selected and retained on a merit basis, to carry on the inspection and safety education programs, both of which are necessary to the reduction of injuries, (4) Each state should collect and analyze accident data necessary in planning preventive measures and make available to management and labor such information to stimulate further action toward the reduction of job injuries. It was further recommended that the federal government through the Bureau of Labor Standards of the United States Department of Labor should continue to provide information and services in the safety education field.

Insured Service

ADOPTION of the plan of health insurance in England has raised many questions abroad and in this country. One of these of particular concern to industrial nurses deals with the relation between the National Health Service and the various health services provided in industries which make a call upon medical and associated services. A special committee to study this subject was appointed in England. The charge to the committee was as follows: "To examine the relationship (including any possibility of overlapping) between the preventive and curative health services provided for the population at large and the industrial health services which make a call on medical manpower (doctors, nurses, and auxiliary medical personnel); to consider what measures should be taken by the government and the other parties concerned to insure that such medical manpower is used to the best advantage." The conclusions drawn after the study were: (1) The institution of a comprehensive occupational health service would be doomed to failure on the grounds of lack of sufficiently trained medical manpower and the national economic situation; (2) Many sections of the country are anxious for the development of this branch of medicine so that facilities similar to those found in the larger and more enlightened industrial organizations would be made available to all employed persons at the place of work so far as circumstances would allow; (3) To carry out any such plan of expansion, new legislation would be required;

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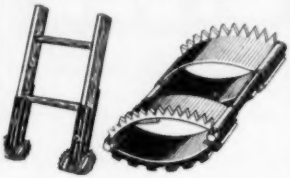

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(4) Much more information regarding industrial medical services is required before expansion would be justified. In the light of the recent election results it does not seem that any further medical changes will be made in the near future.

Top of the List

CURRENT industrial hygiene and especially workmen's compensation matters of top interest are evident in a schedule of conferences that has been arranged by the post graduate division of a New York medical school. Among the topics listed for discussion in a week-long conference are the following: (1) recurrent dermatitis and long-lasting dermatoses; (2) the role of the industrial environment on dermatoses which are not of industrial origin; (3) importance of skin tests, especially patch tests, in determining causal relationship; (4) importance of proper records and forms in determining compensability of claims; (5) peripheral vascular disease; (6) myo-cardial damage; (7) pulmonary diseases, especially silicosis and asbestosis; (8) orthopedic problems; (9) occupational diseases, including beryllium, toxic effects of solvents, including benzol and carbon tetrachloride, lead poisoning, radiation and its effects; (10) neurology, neurosurgery, psychiatry in industry, and related workmen's compensation problems; (11) radiology and (12) occupational causes of cancer and tumors. While it is evident that few, if any, of these topics are essentially new, it is apparent that many difficult and serious medical, surgical and related problems are very much to the fore among leaders in industrial hygiene, industrial medicine, and workmen's compensation. This continued interest is a healthy sign that thought continues to be given to the ailing and injured worker, and to ways and means of preventing his ailments, whether they be acquired in industry or otherwise.

Aches and Pains

THE patient who complains of aches and pains in the muscles and joints is frequently seen in general medical practice as well as in the industrial medical department. He may also complain of chronic fatigue and of a slight fever. These cases may be diagnosed as tuberculosis, rheumatism, and recently chronic brucellosis has been added to the list of possible diagnosis. The tendency has been to recommend a regime of rest and a restriction of routine activity. An investigation has indicated that such patients are usually poor sleepers, their sleep may be disturbed by dreams. They may have mental problems which are disturbing them, and may have made a poor sexual adjustment. Significant emotional conflicts have been found in some, and such difficulties may apparently be responsible for the manifestation or complaint of fatigue. A significant feature discovered as being associated with some instances of muscular aches and pains is the presence of chronic emotional resentment of which the patient may be totally unaware. In chronic orthopedic conditions such patients are apt to be accident-prone. Some virtually refuse to get well, and may even decline to a quasi-infantile emotional stage. Industry cannot long put up with such individuals for they become poor producers, are difficult to deal with, have a high absentee rate, and are on the whole poor risks. Unless psychiatric services are available they are apt to create real problems. Care must, of course, be exercised in not labelling all who report with aches and pains as belonging in this general category. It remains for the skilled physician to reach a diagnosis and prescribe the treatment.

Course in Industrial Hygiene

(Continued from page 60) layout; skin hazards; hazardous liquid problems; hazardous metals, dusts, and gases; and X-ray and radiation problems.

The course is open to all safety personnel, including those in any way responsible for or interested in safety. Applications for enrollment should be submitted in writing to H. E. Miller, School of Public Health, University of Michigan, Ann Arbor, Mich. The enrollment fee is $5.00. A limited number of rooms will be available, for which separate application should be made to the Michigan Union.

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E PROTECTION

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eratories, Inc. Of unusual inter- this pocket-sized, 36-page booklet ick-reference alphabetical order, l, gas and common fire hazard Index specifies for each listing -fighting agent recommended as by the National Board of Fire d the National Fire Protection also contains basic facts about f fire fighting in illustrated and A more worthwhile booklet is

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chclock Div., Great Lakes Indus- page, illustrated folder entitled g Your Watchman Tonite," shows lock system automatically keeps watchman's route through the s of this system, supervisors can watchmen are on the job and on fire, burglary or sabotage.

RIALS HANDLING

Materials Handling Tools. 6

rs. This is the first catalog in ing this company's complete line , including the Merrill-Volz lifting r materials handling tools. The contains essential technical in- s, drawings, and pictures, making reference book.

lelts 7

ire Cloth Co. A 4-page folder woven wire belts can be used on ns and equipment. This type of ring, easy to clean, and permits the free circulation of air and heat. Illustrated and described are both the smooth-surfaced balanced wire belt and the open-mesh rod-reinforced belt.

Material Handling at the Machine ... 8

Lyon-Raymond Corp. This 16-page booklet shows how proper positioning of materials saves unnecessary handling during production operations. It describes and illustrates 12 different types of equipment of various manufacturers and shows how each contributes to various phases of positioning. Two process charts show that positioning operations exceed those of transporting and tiering combined and should therefore receive more attention than they have in the past.

ATMOSPHERE CONTROL

Ceiling Air Diffuser 9

W. B. Connor Engineering Corp. A 2-page illustrated bulletin is available showing the Kno-Draft Adjustable Air Diffuser which has been newly designed in a square panel of lightweight metal. This design permits installation in all standard acoustical-type and rectangular panel ceilings. The bulletin gives full details on sizes and dimensions and points out that the diffuser is adjustable for air volume and the angle of discharge.

Air Filters 10

Research Products Corp. A 6-page folder describes a new line of Multi-Velocity air filters for air-conditioning equipment. Designed to operate at either the conventional or the so-called high velocities, these filters are available with aluminum or copper media for heavier duty applications. The folder points out that these filters are easy to clean, and it includes tables giving data on sizes, capacities, etc. Also available is a bulletin on the newly designed light weight washable air filter, E Z KLEEN.

Leak Detector 11

Vacuum-Electronic Engineering Co. A new 4-page bulletin describes the Veeco Mass Spectrometer Leak Detector for application wherever a vacuum, fixed pressure, or special atmosphere must be maintained for extended periods of time. The bulletin covers the principle of operation, features, and pertinent data pertaining to vacuum testing and pressure testing.

PLANT MAINTENANCE

Special Aluminum Paints 12

The Skybryte Co. This 4-page folder informs you at the very start that "One Aluminum Paint Can't Do Everything." It describes in detail and gives prices for six types of aluminum paints: RUST-TOX for direct application to rusted surfaces, heat-resisting interior paint, heat-resisting exterior paint, acid and alkali resisting paint, Fence-Bond for rusted chain link fences, and utility aluminum paint.

HAZARDOUS MATERIALS

Piping & Valve Identification Tags 13

Jas. H. Matthews & Co. This 4-page illustrated and colored folder shows the metal tags which can be quickly and easily attached to pipe lines, valves and junctions for accurate and safe identification of the material carried. The tags are available in five colors which follow the recommended safety color code for pipe identification. They are also available in 26 different shapes for better differentiation. The name of the material carried in the pipes can be either embossed or stamped on the tags.

Chlorine Handbook 14

Diamond Alkali Co. This handbook has been prepared specifically to help meet industry's growing need for basic data covering the safe storage, handling and use of chlorine as well as its physical properties. The 44-page technical manual is well illustrated with graphic charts, drawings, tables and pictures to show chemical and metallurgical engineers, works managers and other process executives how to store, handle and use chlorine with maximum safety for personnel, plant and equipment.

SAFE FLOORING

Rolled Steel Plate 15

Inland Steel Co. This 4-page folder, studded with numerous pictures, gives all the pertinent details on Inlands 4-Way Safety Plate. Used for factories, ramps, steps, platforms, truck beds, etc., the raised lugs assure safe footing and long wear. This flooring is strong, firesafe, non-absorbent, easy to clean, and slip resistant. Valuable tables in the folder give data on sizes and safe working loads for all three of the patterns.

ELECTRICAL EQUIPMENT

Explosion Proof Motors 16

Reliance Electric & Engineering Co. Prepared expressly for engineering, production, purchasing and maintenance men, this new 2-page bulletin describes explosion-proof motors from ½ to 125 hp. It contains information on three types of explosion-proof motors, with emphasis on those for Class I, Group D locations having gasoline, oil, naphtha, alcohol, lacquer solvent and similar contaminants.

HEAD PROTECTION

Safety Hard Hats 17

Safety First Supply Co. Safety hats made from glass? But definitely, and they are stronger than steel, according to this 4-page illustrated bulletin. The protective shell is made from resin-impregnated Fiberglas, which provides high resiliency, light weight and coolness, in addition to being fire- and water-proof. Available in colored full-brim and miner's cap styles, and also with a phosphorescent finish which glows in the dark.

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NEW PRODUCTS

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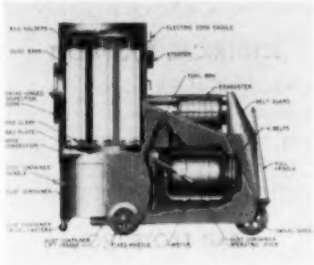
PLASTIC COVER PLATES

A NEW, clear plastic cover plate to protect costly welding plates from damage is announced by American Optical Company. These new plastic plates—manufactured from methyl methacrylate, the material used for bombers' noses and navigators' turrets during the war—meet the optical requirements of the Federal Bureau of Standards.

The plates do not pit as readily from welding spatter as glass plates, are .060" thick assuring adequate impact resistance, and will outlast ordinary glass cover plates many times over.

Two sizes are available: standard, 2" x 4½" and a slightly smaller size, 2" x 4⅛", provided on special order.



HEAVY-DUTY VACUUM CLEANER

FOR greater efficiency and ease in disposing of industrial dust problems, the Air Appliance Division of the U. S. Hoffman Machinery Corp. has added a new, 3 h.p., heavy-duty, portable vacuum cleaning unit to its already extensive line of dust-control and maintenance equipment. This new Hoffco-Vac #30, providing 4.4 cubic feet of dust storage capacity and designed for continuous operation on heavy dust deposits, provides efficient operation, compactness, and maneuverability to a degree not offered in units of this size.

The equipment will operate one 50-foot length of 1½-inch vacuum hose and utilizes nine dust bags, for a total bag surface of 30 square feet—a feature of separation of hazardous fine dusts. The importance to safety and insurance engineers and inspectors concerned with the vacuum producer is of the multistage centrifugal type, made from aluminum castings. The whole unit is 66 inches long, 32¼ inches wide and 63½ inches high, with two fixed wheels and one swivel.

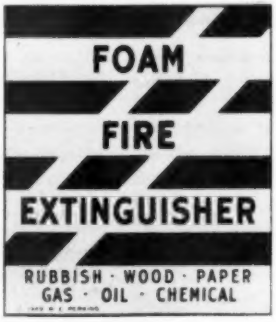
For fast, easy dust disposal, the dust container is lowered or raised by the action of a single lever. Three swivel casters on the container permit it to be rolled to the disposal point. The unit also includes a carrying rack for the hose and a box for the cleaning tools. For details, send in the coupon.

NEW EXTINGUISHER LABELS

FIRES don't wait for you to fumble the extinguisher; they just keep burning along. To help identify and locate the proper fire extinguisher in a hurry, the Meyercord Co. has developed three new decalcomania sets for positive selection of three types of extinguishers for fires of: 1. Wood, paper, rubbish; 2. electric, gas, chemical; 3. of any origin except electrical.

A large decal (8" x 9") can be applied to the wall above the extinguisher, and a smaller one (1¾" x 2") for the extinguisher itself. They identify in three ways: by color code, by design, and by printed instructions naming proper use. The decal color for fires of wood, paper, etc. is black and yellow diagonal bars; for electric, chemical or gas fires, red and white horizontal bars; and for foam extinguishers, red and white horizontal bars with a yellow and black diagonal stripe.

These labels reduce the time lapse in selecting the right extinguisher, and are especially valuable when employees have color deficiencies or are unable to read. For full details, send in the coupon.



BARREL TRUCK

THE Modern Equipment Company, Inc. of Nebraska has announced the development of the new "Challenger" Barrel Truck. One man can load and move barrels without danger of strain or accident.

A unique feature of the truck is that it stands by itself. This design simplifies loading and solves the storage space problem for handling equipment. The wheels of the truck never leave the floor, eliminating the need to lift extra weight when loading. The truck weighs 56 lbs. and is available with many types of rubber-tired and semi-steel wheels. It is made entirely from steel, electrically welded for strength. For full details, send in coupon.

SUMMER SAFETY SHOE

THE Iron Age Division, H. Childs & Co., Inc. has introduced a new style in safety shoes particularly developed for foot ease and comfort during hot weather. This model, No. 614, is made in the popular moccasin oxford pattern and has a woven vamp. It has been appropriately named the Iron Age "Moc-Weave."

There are two noteworthy features that make this safety shoe stand out from the ordinary. The woven vamp is perforated, as is the inner lining. These air passages permit cooling draughts to reach the foot with every step. For added comfort these shoes are soled with nationally advertised "Neolite," which is said to outwear leather two to one.

For additional information and prices on "Moc-Weave" safety oxfords, use the convenient coupon.

WELDING MASK FOR TOXIC AREAS

A COMMON problem in many industries where toxic materials must be stored or handled is that of repairing tanks and other equipment by welding. This is particularly true of the petroleum industry's storage of leaded gasoline. William A. Newman of the Safety Dept. of Ethyl Corp., working with representatives of several oil companies and Mine Safety Appliances Co., developed a protective hood for welders in atmospheres containing toxic vapors, dusts and fumes.

The device combines in one unit protection against ultra-violet and infra-red radiation, impact and pitting, and inhalation of toxic fumes. The facepiece assembly consists of an air-tight rubber mask

and chrome leather hood with flexible breathing tube connections. The aluminum frame eyepiece holds a permanent safety lens and also two removable welding and pitting lenses inserted in the flip front. The facepiece affords wide angles of visibility.

For tank or similar work, an approved air line is used to supply air to the hood. The facepiece is also adaptable to airline respirators and all-service canisters for work outside of tanks. With this mask, oil tank cleaning crews need only remove the explosion hazard prior to welding operations. For further details, send in the coupon.

NEW HANDPAD

THE GS Safti-Mitt Handpads, designed by safety glove specialists, offer maximum protection and comfort. Adjustable to any size hand, the new snap-fastened strap keeps the pad on and makes removal easy. Workers will appreciate their coolness and comfort as well as the long wear in these heavy horsehide pads. They are available from the General Scientific Equipment Co. of Pennsylvania.

The use of the GS handpads prevents costly hand injuries and helps speed production. Time lost from hand accidents and infections is greatly reduced. They are especially suitable for handling brick, tile, metal sheets, stampings, sharp-edged castings, cartons, paper, cases, etc. For complete details, use the convenient coupon.

CHEMICAL RESISTANT FABRIC

GRA-LITE fabric, developed by the Standard Safety Equipment Co., now combines the best features of protection, comfort and durability demanded of a safety material. This new fabric provides greater resistance to a wider range of chemical hazards, including—with special preparation of the compound—resistance to anhydrous hydrogen fluoride. With Gra-Lite compound, it is possible to completely seal over garment seams and prevent chemical seepage. For maximum worker comfort, it is more than 40% lighter than the ordinary impervious fabric and extremely flexible.

Gra-Lite compound thoroughly penetrates the fibres of the base fabric which makes it highly abrasion resistant and withstands harsh cleaning agents. It will not mildew or rot. Complete impregnation also provides chemical resistance on the inner surface of the material.

This company will send sample

swatches for testing and a descriptive bulletin. They request knowledge of the specific hazard to be tested. Send in the coupon.

SAFETY INNERSOLE

A NEW safety innersole has been developed by the Rubberhide Company, Inc. of New Jersey. It consists of a top-grade leather innersole, a special spring steel plate and rubber frictioned cotton duck, all bonded together with a special cement under extremely heavy pressure. By inserting this puncture-proof innersole into any conventional work shoe or rubber, those dangerous foot injuries from punctures can be eliminated.

Industrial workers, firemen, contractors, wreckers, etc. need not worry about stepping on nails, glass, rocks or other sharp objects when they have the security of these safety innersoles. For full details, send in the coupon.

April, 1950

To SAFETY ENGINEERING

75 Fulton St., New York 7, N. Y.

For prices and complete details of items mentioned in this month's "What's New in Safety Products," check items that interest you and mail coupon.

- ☐ Plastic Cover Plates
- ☐ Vacuum Cleaner
- ☐ Extinguisher Labels
- ☐ Barrel Truck
- ☐ Summer Safety Shoe
- ☐ Welding Mask
- ☐ Handpad
- ☐ Chemical Resistant Fabric
- ☐ Safety Innersole

Firm Name .....

Attention of .....

Position .....

Firm Address .....

City .....

If You're Looking For:

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- SKIN PROTECTION
- PRESS GUARDS
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- BUILDING MAINTENANCE
- FIRE PREVENTION
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- SIGNAL EQUIPMENT
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- FIRE EXTINGUISHERS
- BODY PROTECTION
- SAFE ACID HANDLING
- EDUCATIONAL AIDS
- ATMOSPHERE ANALYZERS
- EYE PROTECTION
- WASHROOM SANITATION
- DUST CONTROL
- FIRST AID
- ARM & LEG SAFETY
- HEAD PROTECTION
- FIRE CONTROL
- RESPIRATORY PROTECTION
- LIGHTING
- FIRE DETECTION
- SAFE WALKWAYS

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BEST'S

SAFETY DIRECTORY

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TIME FOR *Thantis* LOZENGES

For throat irritations 'Thantis'* Lozenges provide effective relief. 'Thantis' Lozenges are especially beneficial in soothing these conditions because they are both antiseptic and anesthetic for mucous membranes of the throat and mouth. These effects are due to the two active medicinal agents, 'Merodicein'* an antiseptic of low toxicity, and Saligenin, a mild local anesthetic. When 'Thantis' Lozenges are dissolved in the mouth, the two ingredients dissolve slowly, providing prolonged medication of the throat.

Each lozenge contains 'Merodicein' (H. W. & D. brand of monohydroxymercuridiiodoresorcinsulfonphthalein-sodium) 1/8 grain, Saligenin (orthohydroxybenzyl-alcohol, H. W. & D.) 1 grain.

Supplied in vials of 12 lozenges in individual cartons.

*Reg. U. S. Pat. Off.

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